CURRENT NOTES

Your Monitor on the World of Atari

Vol. 12, No. 5

June 1992
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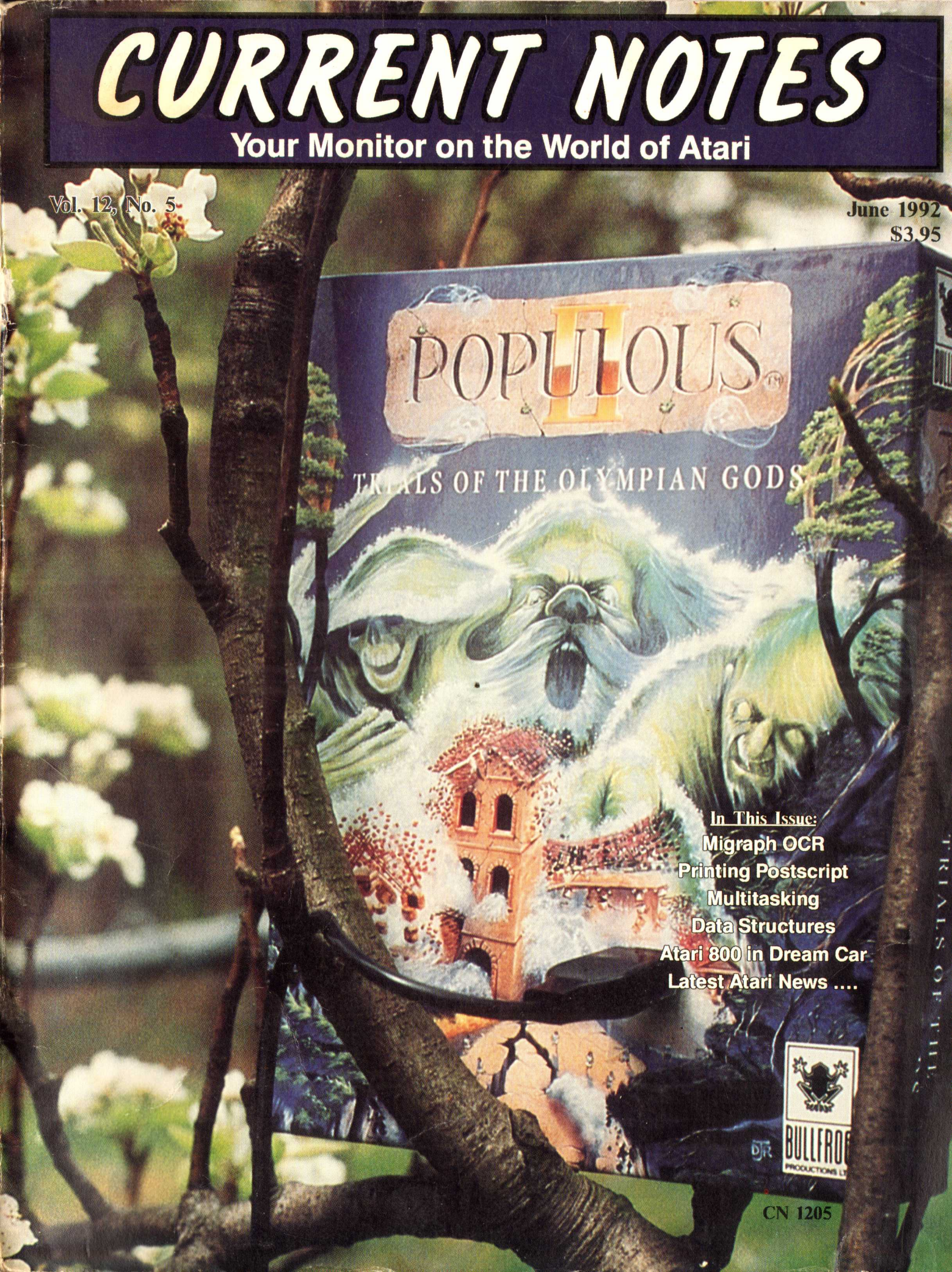

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CN 1205

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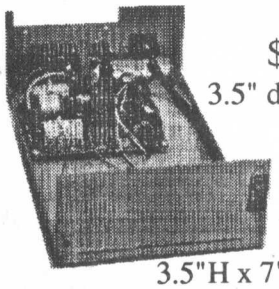

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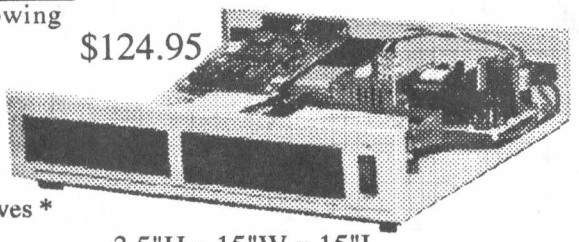

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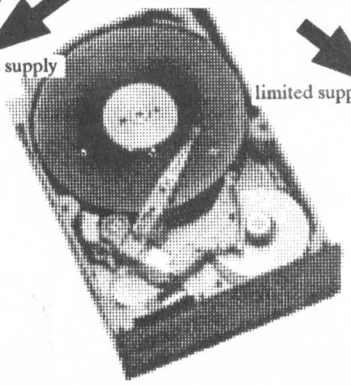
170MEG 15MS - $744
240MEG 15MS - $884
330MEG - $1341
425MEG - $1404
520MEG - $1474



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SC1435 14" color monitor - $349
Atari 1.4Meg floppy kit - $139

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Zoom 2400 - $74 Zoom2400V.42bis- $146
Supra 9600 v32- $269 Supra 9600 v42-$349
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ProDrive LPS105S- 105Meg 17Msec- $369
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(Board w/chips 2.5Megs- $155)
Z-Ram/Mega II- 4Megs - $75
(Board w/chips- $155)
1 Meg Chips **$5.00 ea Simms - $42**
JRI Memory Board(uses simms)- **$99**
Xtra RAM ST Deluxe(uses simms)- **$79**

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Autoswitch Overscan- $109
Blitz cable w/software - $46.95
D.E.K.A. interface- $95
Drive Master - $32
Drive extension cable 6 ft - $13.95
DVT-VCR hd backup - $69.95
Flashdrive Portable HD case (for portfolio)- **$139**
Hand Scanner(w/Touchup) Migraph - $269
Hand Scanner Golden Image W/TOUCHUP - **$215**
HP Deskjet 500 printer - $469
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ICD Advantage (no clock) - **$83.77**
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ICD Advantage Micro (Mega's) - **$77**
ICD Cleanup ST - $25
Lantech Local Area Network- $299
Mega Touch Springs - $9.49

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Mouse (Opto-Mechanical) - $37
Mouse (Optical)- $53.95 Mouse (Cordless)- **$80**
Mousestick (Gravis)- **$65**
Multi Sync Switchbox - $53.95
Panasonic KPX-1124i 24pin - $319.95
Panasonic KPX-1123 24pin - $234.95
PC Speed- $199
AT Speed C16 (16MHZ version)- **$369**
Speed Bridge (Mega/STe/Mega STe) - $65
Spectre GCR(cart)- **$215**
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Star NX1001 - $155 Star NX-2420 - $249
ST/time (under rom clock) - **$43**
Supercharger W/1Meg - **$419**
Synchro II - $59
TEC (Tos extension card)- **$135**
TOS 2.06 - $70
TC Power (software for IBM emulators) - **$39.95**
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Tweety Board - $30.95
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REVIEWS/ARTICLES

VOLUME 12, NO. 5, JUNE 1992

NEWS/ANNOUNCEMENTS

DEPARTMENTS

MOVING?

Don't forget to send in a change of address notice if you are moving. *Current Notes* is distributed via second class US mail. The post office does not forward second class publications; they throw them away.

The cover: Invoking the forces of nature is standard stuff in god games like the popular Populous II. Which evokes a key question: Is such activity cathartic or stimulant? Photo by Mike Heininger, (c) 1992.

ATARI SHOW ANNOUNCEMENTS

June 14: Milwaukee Atari Show

The Milwaukee Area ST User Group (M.A.S.T.) has finalized plans for a second show in Milwaukee! The show will be held at Bowlero, Red Carpet Lanes in Wauwatosa, WI from 10:00 AM to 5:00 PM. For further information: GEnie: R.CARPENTE18; US Mail: PO Box 25679, Milwaukee, WI 53225–0679. Phone: (414) 463–9662.

July 18: 1992 Blue Ridge ATARIFEST

The Blue Ridge Atarifest will be held from 10 am to 6 pm at the Westgate Shopping Center, Asheville, N.C. Banquet will be held Saturday evening immediately following the show ($17.50/person). For more information on this one day event, contact Van Estes, BRACE President (704) 685–8358. A variety of hotels and motels are available in the area, but reservations should be made immediately, as July is the height of the tourist season.

July 25: MIST Atari Fest IV

The fourth MIST Atari Fest will be held again at the Castleway Conference Center, 6385 Castleplace Drive, Indianapolis, Indiana. The 1991 show drew 30 vendors and 500 individuals. The conference center has ample parking and is close to several reasonably priced hotels, many fine restaurants, and the largest mall in Indianapolis. For more information call Dan Ward (317) 254–0031 or send E–mail to D.WARD10 on GEnie.

July 25–26: Northern California Atari Expo

The first Northern California Atari show in two years was announced by a coalition of three local Atari user groups. The show will be held at the Exhibit Hall, 145 W. San Carlos, San Jose. The 1990 show was highly attended and very successful. The show will run from 10 a.m to 5 p.m. each day and admission is just $5.

For additional information on the show contact N. California Atari Expo, c/o SLCC, P.O. Box 1506, San Leandro, Ca 94577. GEnie: M.WARNER8 or call at (510) 352–8118.

August 15–16: Connecticut AtariFest '92

The Connecticut AtariFest '92 will be held at the Sheraton Hotel at Bradley International Airport, Windsor Locks, CT. The show is being sponsored by three Atari user groups and will showcase the latest Atari products and services, as well as offering seminars on desktop publishing and video production, hands–on instruction from manufacturers and software developers, MIDI demonstrations, giveaways, a swap room and much more.

For more information about attending or exhibiting at Connecticut AtariFest '92, contact Brian Gockley, chairman, 18 Elmwood Avenue, Bridgeport, CT 06605 [Phone (203) 332–1721].

From the Editor's Desk

by Joe Waters

Everyone has, undoubtedly, heard the expression, "You can't see the forest for the trees." That can apply to many, many things. The world is, obviously, going through a major revolution with the end of the cold war. We read things in the paper every day indicating not only changes in the world order, but changes in the U.S. social structure as well. It is hard to put this all in perspective when we experience it on a daily basis, particularly when it is very unclear where this is all leading.

The world is also undergoing a technological revolution that is bringing forth the Information Age just as surely as earlier advances in technology brought forth the Industrial Revolution. As owners of home computers, all of us are directly involved in this latest technological surge. However, it is difficult sometimes, as we agonize over the latest computing mystery to befuddle us, to see the broader changes we are experiencing.

Many computer studies charting the progress of computing technology suggest that progress has been fairly constant since the days of mechanical hand calculators. Computing power is *doubling* every 2.5 years. Put another way, the cost of any given level of computing power is cut in half every 2.5 years; what we paid $2,000 for five years ago, costs only $500 today. Information storage costs are also falling commensurately with increases in computer capability. In your own experience, consider the cost, and storage capability, of the floppy disks you have purchased over the past 5 to 10 years. Even the cost of transporting data, via telecommunications, continues to fall. (How many recall when a Hayes 300 baud modem used to sell for $700?)

There are a lot of technologies involved in this transformation to the Information Age. Whether we realize it or not, little by little, month by month, we owners of home computers are exposed to these technologies. Each month we learn a little more and, over time, you will find that you are going to know, and understand, much more about the world around you then your neighbors who don't have computers.

Current Notes is playing an important role here. In this issue, for example, you will learn a little more about multitasking, a little more about printer resolution and storage requirements, a little more about optical character recognition, about programming data structures, about telecommunication options, MIDI software capabilities, computers and cars, and on and on and on. With each issue, almost without your knowing it, your computer literacy increases.

To provide a little historical perspective and some nostalgia, I've included a new feature this month. *CN History* provides a brief glimpse at what appeared in *CN* 10 and 5 years ago. In line with our comments on pricing above, note that five years ago a PC/XT system (computer, EGA monitor, hard drive) cost just under $2,000. A color Atari 1040ST with a 20MB hard drive and Atari laser printer sold for $3,000. Check your local ads to see what $2,000 or $3,000 will buy you today. Just imagine what it will buy you five years from now.

Ten Years Ago in Current Notes

[Here are two short reviews by Nick Stoer reprinted from the June, 1982 issue of Current Notes.]

Family Cash Flow (APX 20080, $17.95). This is a well designed and forgiving (e.g. audible cues if you attempt to enter data incorrectly) program which lets one categorize all houschold income and expenses by month. You can tailor categories to fit your own needs. About 5-10 minutes a week or one 15-20 minute session a month is all the time you need to update your data base. It has many print options and very good documentation. This is one of those programs that demonstrate the utility of your Atari. The program comes with illustrative dummy data, which you discard when creating your own files. The master diskette retains the data so you can demonstrate the program to others while retaining your financial privacy. This program is a companion to *Family Budget* (APX-20108), which I haven't bought yet. *Family Cash Flow* is a good buy. Requires disk drive, printer optional.

Number Blast (APX-20097, $12.95). This is an excellent addition and multiplication drill for kids in grades 1 to 5. There are six "games," each with three levels of reaction time. Points are won or lost. The use of joysticks helps eye-hand coordination and adds "fun" to math drill. Two kids can play at once, but they should be fairly evenly matched in math skill. It can also be used as a flash card system between parent and child, or by one child alone as a drill. Graphics and sound are functional. My kids and their friends enjoy it.

Five Years Ago in Current Notes

[This paragraph was found in the Editorial in the June, 1987 issue of CN.]

Bye, Bye, Black ... As many of you know, Black Patch Systems is no more. The two young owners took their fledgling business on a meteoric ride; they grew and grew and grew. They also advertised. As they advertised, they grew further and advertised more. Their advertising, along with their pricing structure, went beyond good business sense. The business sputtered, and faltered, and collapsed. At the end, the business was tens of thousands of dollars in the hole. They declared bankruptcy. Black Patch was not a corporation; it was not a partnership; it was just these two young men. Both are now personally responsible for all that debt. Since all the money coming in went primarily to build up more business, neither one built up any significant assets. It will take them a long time to pay off the bills.

[Computer prices from some of the ads in that issue: 1040 color system, $900; Atari 20 MB hard drive, $600; Atari laser printer, $1,495. Atari 130XE, $130; 1050 disk drive, $150; 1802 color monitor, $250. Panasonic KX-P1092 printer, $400. PC compatible: 640K PC/XT, 4.77 MHz, 2-360K disk drives, $725; EGA color monitor $550; EGA card, $235; 20 MB hard drive w/card, $450. Total PC package: $1,960.]

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☐ Dragon Slayer Escape Singes Castle	$39.99
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☐ Falcon Mission Disk #1 or #2	$19.99
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☐ Gauntlet III	$39.99
☐ Gods	$34.99
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☐ Lemmings	$34.99
☐ M1 Tank Platoon	$35.99
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☐ Metal Mutant	$34.99
☐ Mid Winter I, II	$34.99
☐ Obitus	$39.99
☑ Pacific Islands	$39.99
☐ Police Quest I or II	$35.99
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☐ Populous 2	$39.99
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☐ E Z Grade	$45.99
☐ Diamond Back II	$39.99
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☐ DC Desktop	$27.99
☐ Universal Item Selector III	$15.99
☐ MultiDesk Deluxe	$39.99
☐ Word Writer ST	$39.99
☐ NeoDesk 3.2	$39.99
☐ LDW Power 2.0	$99.99
☐ Hotwire	$25.99
☐ Interlink ST	$25.99
☐ BBST	$25.99
☐ Turbo ST	$35.99
☐ Tracker ST	$49.99
☐ Cardfile 3.0	$29.99
☐ GFA Basic 2.0	$19.99
☐ GFA Basic Companion	$19.99
☐ Image Cat	$29.99
☑ Warp 9	$34.99
☐ DB Man V	$179.99
☐ ST One Writer	$59.99
☐ Logistix	$19.99
☐ Mug Shot!	$29.99
☐ Code Keys	$27.99
☐ DC Utilities	$23.99
☐ G+ Plus	$25.99
☐ Stalker 3.0	$34.99
☐ Look It Pop It	$27.99
☐ HyperLink	$99.99
☐ Data Diet	$49.99
☐ Time Link	$9.99
☐ Steno 2.0	$19.99

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☐ Star NX-1001	$139.99
☐ Star NX-1020 Rainbow	$199.99
☐ Star NX-2424 Rainbow	$299.99
☐ Panasonic KXP-1181i	$169.99
☐ Panasonic KXP-1124i	$279.99
☐ Panasonic KXP-2123	$239.99
☑ Panasonic KXP-2180	$185.00
☑ Color Kit for 2123 or 2180	$49.99

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☐ OCR for Hand Scanner	$250.00
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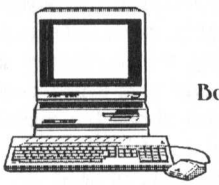
☑ Cystal Mines 2, Super Skweek, Toki	$34.99



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☑ SC 1435 Color Monitor	$299.99
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☐ Atari SF314 DS Drive	$149.99
☐ Supra 44 Mb Cart HD Drive	$599.99
☐ 44 Mb Cart	$69.99
☐ Supra 50 Mb Hard Drive	$399.00
☐ Supra 120 Mb Hard Drive	$559.99
☐ Supra 2400B Modem	$95.00
☐ Toner Cart for 804LP	$49.99

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☐ Atari 1040 ST	$200.00
☐ Atari 520 ST w/354	$125.00
☐ SC1224 Color Monitor	$150.00
☐ SM124 Mono Monitor	$95.00
☐ IB 5 1/4" Drive for ST	$50.00
☐ SF354 SS Drive	$50.00
☐ SF314 DS Drive	$95.00

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Letters to the Editor

Dave Small and April CN

Dear Joe,

I wish Dave Small would stop writing about all the topics that I reserve for my own deeply personal sources of motivation (if I had to name a movie that changed my outlook on the world, it's a toss-up between "2001" and "Silent Running"). Reading Dave's column "The Fire Within" in the April CN, I felt hairs raising on my back as I digested his commentary on Gary Hudson, the Challenger accident, and NASA.

The Challenger accident was one of the biggest psychological shocks I ever experienced. It took me five years to finally come to grips with it on a personal basis, during which time I sent money to NASA and read every book I could lay hands on about the accident and its effect on America's future in space. Everything Dave said about NASA and the accident is regrettably true.

In the late summer of 1991 my feelings about these matters suddenly coalesced. I put aside all other things, took pen in hand, and entered a plane of existence which cannot logically be described. I emerged from that time with an enormous sense of relief, having set forth on paper my feelings in the form of a poem.

Every year I take January 28 as a personal holiday (much to the puzzlement of my professional colleagues who fail to see the significance of that date). This year, the 6th anniversary of the accident, was a little different. I posted my poem to the Info-Atari8 Digest over Comp-Sys-Atari-8Bit, which was cross-posted to the Atari 8-bit RT library on GEnie. Network response to my post was overwhelming; I last heard it was making rounds on BBSs in Germany.

The very title of Dave's April column, "The Fire Within," is an image taken directly from my poem, in which I refer to "...a Flame as old as Man" and "...that sacred Torch...". I wish Dave would re-tune his telepathic transmitter to a different frequency; the resonance on my end is almost too much. The poem follows forthwith, if you care to print it.

Ben Poehland

In Memoriam: January 28, 1986

She wished to teach her class from Space, and thus to consummate
The Grand Idea: that even Wives and Mothers now could state
The stars above at last were ours, for Everyone, and not
Just for astronauts, courageous men who cast their lot
With danger. Not aware was she of what a heavy Price
Can be attached to Knowledge; no conception loaded Dice
Were to be rolled upon the other six with her that day,
Upon the great experiment whose fate was now in play.

Did they have their private doubts, or fears, these seven crew
Soon to join the company of those selected few
Of humankind who satisfied with precious, fragile lives
The dreadful debit that accrues whenever mankind strives
Like Icarus did, to cast away and flee the primal chain
That straps the mind of man to earth with ignorance and pain?

Beneath the ozone gaming board were men who clearly saw
Destruction wrought from blow-by gas upon the field-joint flaw,
And raised within the Labyrinth a tocsin of alarm
Foretelling of disaster, violence and harm.
But high above the lattice-work a Schedule had been set:
By magic of their Signatures, each Player placed his Bet
To quell the voices of concern, and show posterity
What happens when the light of Truth gets cloaked with Fantasy.

There were questions of the ice, of course, but no one dared
Disrupt the sacred List Of Yearly Launches. Were they scared
Of losing face, perhaps? Well, damn the ice! Full speed ahead!
A pox upon you sayers of disaster, gloom and dread!
A Go For Launch! Ignite! Amidst the thunder, flame and smoke
Did no one spot the darkling puff, the booster seal that broke?
What would the Throwers Of The Dice have done, were they to know
Their folly would be captured live, in color video?

The children don their party hats to watch the big bird fly,
And cheer to see that mighty ship, now racing through the sky
Enveloped in a blazing cloud of orange and grey and white,
Diffusing to a milky fork. A most peculiar sight,
As if the broadcast channel had been commandeered and changed
By some fantastic artist all demented, or deranged.
There comes a moment's puzzled pause: "What happened to the show?"
Small voices ask, in plaintive tones, "Where did the Shuttle go?"

The men of Houston stare in shock at data screens, aghast;
The nightmare long predicted, seems happening at last.

They pray within their heart of hearts (as always, not aloud):
Challenger, so beautiful! Exit from that cloud!
Fly away from all the steam, the flaming hot debris--
Let us see you sailing on, magnificent and free!
What's taking you so awful long? Why do you not appear?
Telemetry is lost! Come in! We can no longer hear!

Upon the Flight Deck miles above, perhaps a final shout.
Who possibly will ever know? The cabin lights are out.

In helpless horror unified, silent and alone,
Do millions watch in speechless awe as Nature claims her own.
Unerringly, without remorse, must Newton's Law behave:
Gleaming ship and gallant crew descend into their grave
Beneath the fluid bosom of the timeless rolling Sea
That spawned this race of seeking men, these astronauts to be.

The Rogers Team did yeoman work upon the sad event,
Discovering in course of time, 'twas not an accident
But rather caused by human ills the ancient Greeks knew well:
Duplicity and hubris are a ransome paid in Hell.
The Ransome paid, the Game is closed, the Dice are locked away.
(But what rough Beast, with cloven claw, is picking locks today?)

A Shadow plagues the silent Pad. Old enemies devise
Cruel arguments to make us doubt our Mission in the skies,
To fan the winds of discontent, and so to make it seem
That every man is rogue, or fool, who ever chased a dream.
But buried deep within the marrow, core of flesh and bone
There burns a Flame as old as Man: to Know the Great Un!
known.
We cannot pass that sacred Torch to those who say we must
Allow the dreams of seven souls to perish in the dust!

Those seven faces haunt me still: so vibrant, so alive!
Embodiment of noble aims whose Spirit does contrive
Heroic thoughts that stir my pulse; ideals, the Very Best
Of what Mankind delivers when committed to the Quest.
I feel that Spirit in the stars: exuberant and keen
With Vision set to persevere, explore the wondrous Scene
We've barely glimpsed. We seek our Destiny in powered flight,
Perchance to find- beyond the stars- the Source of distant Light:
Sensorium of Great Events where Being is Begun,
Where Human Grasp and Boundless Dream are melded into
One.

But now, as I reflect upon that tragic day each year,
My heart again must ache. In vain, my eyes suppress a tear.

Benjamin L. Poehland
August 1991

The New, Slow dBMAN

Sir,

I haven't seen any mention as yet of the fairly recent upgrade of *dBMAN* to V. 5.3. A review may be forthcoming, but let me register my experiences with it in advance.

I have used *dBMAN* for several years and found it to meet my modest needs. As each upgrade was offered, I subscribed to it even though the then current version seemed to suffice. On January 8, 1992 I hand-carried my check and order for the new upgrade from V.5.1A to V.5.3 to VersaSoft Corp., which is approximately a mile from my residence. The upgrade finally arrived on March 13, 1992.

Upon installing the new version, I was dismayed to discover that it appeared on my monochrome monitor in inverse color with white characters on a black background. I was just as surprised to find that it appears as a white background with black characters on my color monitor. I can't explain why the two monitor displays are opposite. Also, I haven't been able to switch the colors on my monochrome monitor as I would like to be. I prefer the white background with black characters as the illustrations in the new manual show it to be.

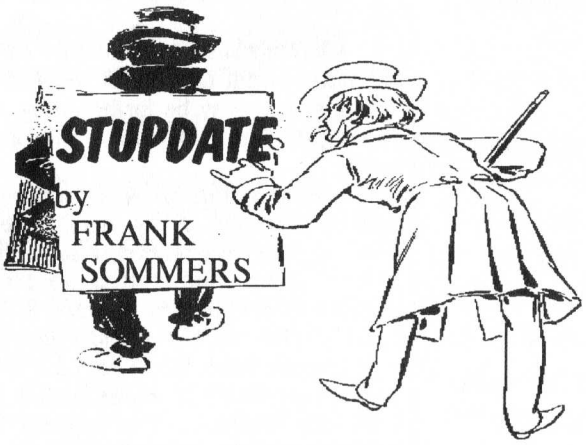
The biggest disappointment, however, is the extreme slow-down of commands such as edit, browse, etc. Most programs seem to include a speedup in revisions; it is hard to imagine why VersaSoft has gone to a much, much slower operation in theirs.

Of course, I also had to go through a series of frustrating "Err54 - Syntax Error" messages when I tried to run my simple command programs. These were eventually worked out and they now run again.

It is also bordering on criminal to find that the registration card that accompanied V.4.3 demands an additional $25 if the user desires telephone support! After all, the upgrade costs $54.71 and support is NOT included?

There are new features in V.5.3 which are an improvement. I especially like the fact that I can now mark records for deletion while in the BROWSE mode. That was a serious deficiency in the previous versions. I suppose there are many other improvements for the advanced users. My requirements are simple, just appending, editing, or deleting records and printing mailing labels. I have never been able to do reports in *dBMAN* (a process described in the manual as being extremely easy).

Ray Arthur
San Jose, CA



ELECTRIC WONDERS, THE STOCK THAT NEVER SOARED, ATARI GAME DIVISION SHRINKS?

Inside Atari decisions had to be made. The push pull continued. It was unclear who had the final say....

When Father Meets Son

They were waiting last month. The corridors of Atari Corp were abuzz with expectations. The President, Sam Tramiel, had spent two weeks in Europe and now was coming home with his report on what was right and what was wrong with Atari business there. The expectations were over the coming confrontation between son Sam and father Jack. (In early May Gary Weiner, Marketing VP and proponent of show-it-and-ship-it for the Falcon, had a meeting with Jack Tramiel and left Atari the next morning.) The issues, as Atari insiders saw them, were simple: how does Atari start making money so it can stay in business (see profit and loss info below) and that included deciding whether it would be a consumer oriented or computer oriented business. Underneath all of that was the normal push pull between a father and son working together and the seldom resolved central question of who makes the final decisions? Perhaps there was a victor and a vanquished, but we doubt it.

Computers or Information Appliances?

Smaller, smaller, ever smaller. At the just finished CES in Chicago, Apple Computers went from palmtop to pocket-size. They announced a small 1/2 inch by 8 inch "Newton." Not a cookie, but a computer that will slide into your suit jacket pocket. With no keyboard, but a light pen that recognizes hand printed characters, it transfers telephone numbers you jot down to an internal phone directory, appointment notes to a calender, and with a built-in modem allows you to fax messages to your office or home. According to Mark Potts of the *Washington Post* later options of the device will have cellular phone options to allow you to transmit data from where you stand. At $700, Apple may, indeed, be out front in the hand-held computer world, which with the new "flash chips" will be generating novel delights with the speed of summer lightening. See Apple's latest System 7 program, *World Write*, which will permit your Apple to speak seven languages.

Electronic Photo Album

You just finished taking your last picture on the roll. Instead of mailing it in to Kodak or dropping it off at Photomat for one day service, you take it home, feed it into your computer and "develop" it to shape, shade and highlight it instantly, and then crop it to size. Then select a frame to put around it and print it out on your printer, or just develop all 32 pictures on the "roll" and view them, at will, on your monitor. Make you drool?

It's the latest peripheral for Macintosh or PC's with Windows (unfortunately, not yet for ST's) to hit

the market. It's made by Logitec and sells for $700. Expensive? Yes, but about half the cost of a flatbed scanner, and conceivably more useful than a desktop publishing setup, if you deal in any business or hobby that hungers for images or pictures of what you're selling, i.e. cars, houses, latest designs of anything from furniture to ladies underwear.

The device, Fotoman Digital Camera produces quite good black and white pictures (when the newest memory chips hit the market, it should be able to handle color) and looks like a Brownie-sized camera, according to our computer guru in Japan, T.R. Reid, head of the Washington Post Bureau in Tokyo. It takes over 3 meg of bytes of photos, 32 pix, in one loading and this is fed via cable into your computer for instant processing with a software program called *Fototouch.* For the computer owner who is shy about the complexities of mastering desktop publishing this would seem to be the perfect answer, plus a barrel of fun.

Wall St. Rose Garden Revisited

Back at the beginning of the decade, Lee Isgur, well-known stockateer, viewed Atari stock as "a turn around pick." That's an opportunity stock that is turning itself around and should be given serious consideration. He expected Atari's earning, down the year before because of the Federated disaster to rise from a negative $1.45 a share in '88 to a plus $1.50-$2.50 in 1990 and then double that in 1991. His reasons were two—the Portfolio and the Lynx. Unfortunately, the Portfolio lost out to a wave of other palm-tops and the Lynx, a superb game playing device, took a beating because of the superior advertising of the Nintendo's Game Boy, an inferior machine by comparison.

Last month, Atari announced its lst quarter earnings for 1992, comparing them with the year before. How did Isgur do?

The 1992 net sales for Atari world-wide were $44.1 million versus $63.4 million for the same quarter the year before. This resulted in a net loss of $13.8 million for the 1992 lst quarter versus a net loss in the lst quarter of 1991 (when Isgur predicted earnings of at least $3 a share) of $2.1 million.

Interestingly, Atari blamed most of the loss on the exchange rate, the cost of the European currencies bought with the dollar. Atari claims that in 1991 the exchange rate cost them $4 million versus a loss because of the exchange rate in 1992 of $12 million. Now if you don't follow all of that, neither do we. What does it all mean for Atari's stock on the American exchange. Not much. During the lst quarter of this year the stock hung steadily between 1 3/4 and 2 per share, occasionally going up or down 1/4 of a point.

The Game Division vs Nintendo

The Nintendo law suit is all but lost. The Atari Corporation suit has been lost; a separate suit involving the games division is about to be. Last year ATARI stated that if it did not win the suit it would have to lay off as many as 240 people in its game division. Once the suit decree is final it will be interesting to see how close this predicition was and how many have to go.

No Class B, No TT's

The machine that was going to turn around the market for Atari has had trouble getting FCC approval for home use, i.e. Class B approval. It has been selling from dealerships to "businesses," while awaiting FCC approval for use in residential areas where radiating electrons can play havoc with people's TV's and other electronic equipment. Rumors are that many of the TT's, as many as 40%, have had to be returned because of malfunctions. Be that as it may, apparently Atari has decided it is not worth the effort to make the TT's radiation proof and they have ceased trying to acquire FCC approval. Sayonara, TT's.

The Top Ten

The old and the young, the stern and the fun loving, a vast majority of them would find their Atari computers a less joyous electric device if it weren't for games, puzzles, simulations, adventures both role playing and arcade style, and other sporting challenges. Sadly enough, there is hardly a U.S. game distributor left for the Atari line. One of the major importers, who can get you any game in three days, is located in Fort Lauderdale, Florida. Their monthly listing of the top ten games is usually on the mark with possibly a disagreement here and there as to the exact positoning of a given game on the list. Here's their May citation:

1) *Epic* from Ocean Software,
2) *Grand Prix* from Microprose,
3) *Steel Empire* by Millenium,
4) *Legend* by Mindscape,
5) *Elvira II* from Accolade,
6) *Alcatraz* by Info Games,
7) *Team Yankee II* by Empire,
8) *Special Faces* by Microprose,
9) *Another World* by U.S. Gold, and
10) *Harlequin* from Gremlin.

(Sideline Software, Tel: 1-800-888- 9273)

A Serious Upgrade

Take a poll of the defectors, the new IBM compatible owners, and they will admit what they miss most are the desktop publishing programs of the ST. *Calamus* has been a leader in this area for several years. Its latest upgrade, *Calamus SL* is top of the line DTP. It offers near total control for the professionals. See it and try it!

Beyond the Dot Matrix

Avoiding Rick's Sneers

A Hearty Hello

I have a surprise for you! It isn't Jello! No, it's your favorite thing! What do you think it is? Ice cream? Escargot? A thesis on the viability of prosthetic limbs? Nope! We're going to talk about Atari desktop publishing—BEYOND THE DOT MATRIX, past the LASER, to where only a few, really nutty people actually get in the Atari world: the IMAGESETTER zone.

We're going to talk about the theory behind computer printing. We're going to talk about different ways we print when using our two favorite Atari DTP packages, *Calamus* and *PageStream*. And then we're going to talk about why using an IMAGESETTER with *either* program is a new kind of adventure—and how it blows the bottom right out of the standard printing "envelope." And then we'll talk about some problems specific to *Pagestream* IMAGESETTER usage. It'll be fun.

Ways Printers Think About Data

Imagine: it's the stone age. It's 1980. You have a bitmapped, black and white picture file on your Atari 800 you want to print out on your Epson MX-80. How do you do it? You send it to your faithful printer, one dot at a time. You take care to give it the message, "Hey this is gonna be a bunch of dots," before you start, and you're careful to line the dots up in rows the printer can understand.

One painful line at a time, your picture was trudged out. This might have taken ten minutes. Your computer was tied up during that whole time, "waiting" for your printer to be free.

This, my friends, was the roots of Desktop Publishing. A sort of "Neanderthal Man" DTP system: printing a controlled, graphical array of dots. And you were there.

Back then you were only talking about printing out a low-resolution picture. Your printer's resolution hovered in the range of 144 dots per inch (dpi), on a good day, for nice printers. If you scaled your picture to cover an entire 8.5" x 11" page, you were talking about sending your printer a mere 237K of computed data. The fact of the matter is that your parallel interface *can* send that very quickly, in under a minute to be sure.

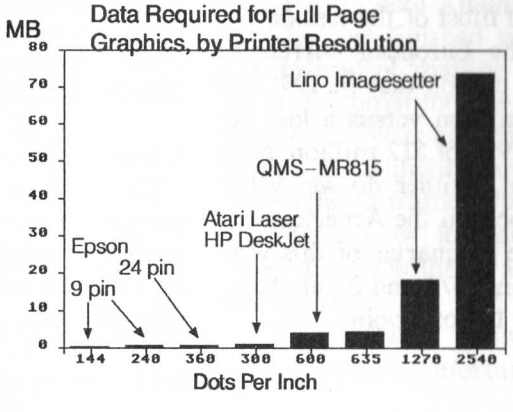
But we all know that dot-matrix printers can only take one line's worth of data at a time. And we all know that your Atari 800 didn't have 237K worth of RAM to hold the computed graphics data. So it didn't matter how fast the computer *could* send the data! We were stuck waiting for the printer to print, line by line, and we had to wait for the computer to figure the image data, one line at a time. Some of us got 64K printer buffers, where large hunks of our 237K page could wait while data were processed by the printer, but that only cut 25% off the time the computer would be tied up for a page of graphics. (The computer won't be free until the last 64K chunk is in the buffer, and there won't be 64K free in the buffer until the other 173K is printed, and that takes *time*.)

It didn't matter, then, that in relative terms, 237K was a lot of data (a 1050 won't hold 237K under any circumstances) to be sending around. We were bound by the speed of our printer. We could have sent it two megs worth of data and it wouldn't change the speed at which the printer prints one line.

Nine-pin printers gained resolution by the mid-eighties. The best ones available now can produce images at up to 240 (horizontal) by 216 (vertical) dots-per-inch.

If we printed our scaled picture from our 800 to this sort of printer at its best resolution, we'd be talking about sending it roughly twice as much data (240 x 216 dpi up from 144 x 144 dpi). In fact, we'd have about 600K of print data.

Twenty-four pin dot matrix printers brought resolutions up to 360 (horizontally) by 180 (vertically). This brings our high-rez 8.5" x 11" bitmapped print data up to about 700K. It's not dramatically more, but it is more data. But another advancement was made with 24-pin printers: they print lines of graphics faster. So even though we're dealing with another 10% of data, our print time for an 8.5" x 11" page of graphics might be roughly the same from a 9-pin and 24-pin printer.



Increased printer resolution creates a parabolic growth curve for the amount of data sent to a printer to obtain full-resolution graphics. Clearly, sending 75 MB to an Imagesetter at 2,540 dpi would be unacceptable slow.

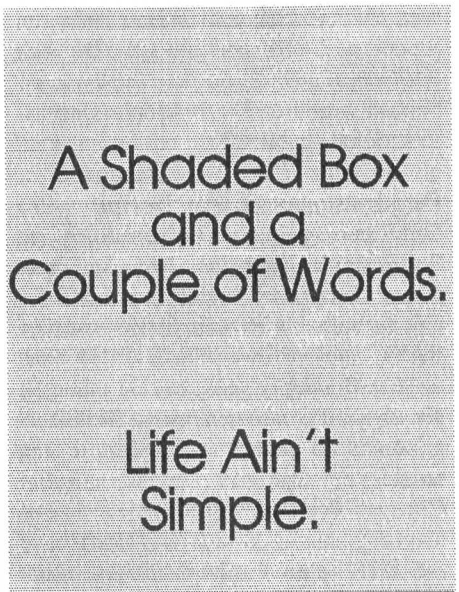
Enter laser printers. They show up at 300 dpi (horizontally and vertically), and suddenly our 8.5" x 11" page jumps up to 1MB worth of print data. Bells should be going off. *It takes a few minutes, indeed, to send 1MB through parallel or serial interfaces.*

What if our page was nothing more than a big shaded rectangle, with a couple of words written inside of it? Through conventional methods, the computer would compute each line in a temporary buffer, send it to the printer, and it would print the rectangle—one line at a time. But wait! Laser printers can't do that! They have to print one *whole page* at once! So we have to send our laser printer *the entire megabyte worth of dot-matrix data.* And the laser printer has to have a megabyte of RAM online, to store this data, so that its laser controller can scan it onto its drum in one swell foop. And we've already said that it would take several minutes to send over this one megabyte worth of data!

All this to print a dumb shaded box with a couple of words on it? And your printer probably has more RAM now than your computer? Time to do a reality check.

It would be much simpler if, rather than our laser printer being simply a dot repository with toner, it could do a little thinking on its own. If we could say to the printer, "Hey, printer, give me a box about so big, shaded, with some words written on it in this here font." Asking the printer to do this might only take a few lines of "program code." We'll come back to this.

There is another way to make things simpler, and I've talked before about how the Atari laser printers work. They "share" memory with the computer, and the computer does all the thinking for the printer. It sets up the page in its RAM, and the high-speed DMA interface allows the printer to image on its drum directly from the computer's RAM. This is smart. The DMA interface will let us transfer that megabyte of data in a couple of seconds. A parallel or serial interface might take several minutes. We also don't have to give the printer any brains or any memory. It's a very sexy, simple system.



Our" shaded box and a couple of words" example. At 8.5" by 11" and 300 dpi, this graphic could be over one megabyte and would take a good while to send to a high—resolution printer.

Hewlett-Packard invented what they call PCL, which stands forsomething ivory-towerish like Printer Control Language. They use it for their HP Laserjet II, III, and Deskjet printers. Many other printers use it, too. It makes an attempt to give the printer some brains of its own, as well as some memory.

With PCL, we can reduce the size of our 300 dpi 8.5" x 11" page to around 500K from 1MB. That's a significant reduction: fully one half the size! But remember, that's just compressing our data. When the 500K gets to the printer, the printer still has to have significant brains, and a full 1MB of memory, to decode our 500K and store the 1MB matrix.

(This isn't true for the Deskjet; it's sent the 500K of "compressed" PCL bitmap information one-line at a time, just like a 24-pin dot matrix printer.)

This is a significant step towards being able to say, "Hey printer, give me a shaded box and some words," but why on earth would it take 500K? Because it isn't really saying that. It's saying, "Hey, printer, here's some nasty muck and when you decipher it you'll find it'll take a meg of memory." That's not real descriptive, and it's totally resolution dependent. If you wanted to print out at 150 dpi, your data might shrink to 200K. That's still too much data and time to waste for a dumb shaded box and a couple of words!

What do we do when we want to print out at higher resolutions and we don't want to have to tell our application what printer and resolution we're printing at? What do we do when 300 dpi isn't good enough, and we want to go at a full 1270 or 2540 dpi? And what do we do about laser printers that are coming out now, operating at 600 dpi? We invent PostScript.

PostScript was invented by the folks at Adobe Systems a few years ago to solve printer problems. It's a language, an "object oriented" language. It works a lot like reverse polish notation. You give it a "thing" to work with, and then you define what you want PostScript to do with it. If our "thing" was a box, we'd give PostScript a little program that says how to make a box (go 50 right, 50 down, 50 left, and 50 up, and trace it with a 1 point brushstroke.) Then we'd tell it where to put the box.

In a test I did, using our "shaded box" and a "couple of words" example, the same file that took 700K worth of dots on our 24-pin printer only took 13K in Postscript. And about 11K of that is *PageStream*-induced administrative overhead. Gee. 13K. That might take a half-second to send to my printer through a parallel or serial interface!

Table 1. Data required for 8.5 x 11 inch page (at maximum resolution), by kind of printer.

Printer	Resolution	Data Represented (bytes)
Epson 9 Pin (Old)	144 dpi	242352
Epson 9 Pin (New)	240 x 216 dpi	605880
Epson 24 Pin	360 x 180 dpi	757350
Atari Laser	300 dpi	1051875
HP Deskjet	300 dpi	1051875 (561000 with PCL)
QMS-MR815	600 dpi	4207500
Lino Imagesetter	1270 dpi	18850769
Lino Imagesetter	2540 dpi	75403075
POSTSCRIPT	Any	Usually (Ideally) 13-400K

If you look at the graph I made, you'll see the parabolic growth curve that's associated with increasing printer resolution. (This makes sense: you're talking about a fixed number of square inches on an 8.5 x 11 page (93.5 in^2, a constant) multiplied by an x-squared sort of curve. It follows that you'd have a parabola.) But just because it makes sense doesn't mean that it's very convenient. Sending your 9-pin printer 237K worth of dots is bearable but slow. Sending your 300 dpi laser printer a meg worth of dots is very, very slow. Sending an imagesetter (at 1270dpi) 18MB worth of dots is simply unbearable, and at 2540 dpi, 75 megs worth of data is excrutiatingly painful. You can see why something like PostScript needed to exist.

The same 13K PostScript program that we send to my 300 dpi PostScript laser can be sent to any other PostScript compatible device. And because PostScript is "object" and "outline" oriented, each device will print our program at the highest resolution possible. So when we send our "shaded box and a couple of words" program to my 300 dpi laser, we get an image that's 300 dpi.

When we send it to Rick Flashman's (up at Gribnif) 600dpi QMS super-hyper-digital laser, it comes out at a full 600dpi. When I send it to Rick Speaks' Linotronic Imagesetter, down in Annapolis, and ask him to print it out at 1270 or 2540 dpi, respectively, it comes out at the full resolution. And since the program is only 13K long, it only takes a couple of seconds to send to *any one* of these swell printers.

So, do you concede the importance of something like PostScript? It removes *resolution dependence* from the data that is sent to *any* printer. With PostScript, we're no longer confined to the 237K-75MB growth curve associated with increased resolution. A page is a page is a page. It's fair to say that a typical, fairly complex PostScript page (8.5 x 11) is 200K (although you can find ways to make them much bigger). 200K for a whole 2540dpi page is nothing compared to 75MB.

Remember that quantity of data sent to printer is almost the only determinant of print time. Remember that at 144 dpi, we're looking at 237K. 300 dpi runs 1MB (500K with PCL), 2540 dpi produces 75MB, and we get 13K with PostScript. Which do *you* think would be fastest and easier to adopt as an international standard?

Disadvantages of PostScript

The primary drawback to PostScript is its price. Because we're giving the printer brains (my QMS-PS 810 Turbo has a 20MHz 68020, 4MB of RAM, and its own 20MB SCSI hard drive), it's simply going to cost money. I got my printer *cheap* at about $2,000. A printer with that kind of feature list would usually run around $3,000. Cheaper PostScript printers exist, but they are usually slower and don't have the SCSI port for hard disk connection. (We'll talk about why this is important soon.)

Since Imagesetters cost around $40,000 to begin with, having a PostScript interpreting on-board computer is not only a good idea (so as to avoid sending it 75MB of data through a parallel port), but it's little extra cost to add. That is, the expensive part isn't the PostScript; it's the printer itself.

Other PostScript Considerations

UltraScript and now CompoScript (and the PD GhostScript) are PostScript *interpreters* that run on the ST. They read in a PostScript *program* and then convert that into a bitmap that your printer can understand—be it a dot-matrix, HP, or Atari laser. But these programs merely provide compatibility with the PostScript standard (and turn standard home printers into viable proofing machines for work which is to be Imageset), they do **not** provide any speed increase; you're still bound to the standard resolution–print data parabolic curve. You're looking at 600K of data to transfer for a decent 9-pin, 700K for a 24-pin, 500K for a PCL laser/DeskJet, and 1MB (at DMA speeds) for the Atari laser. And if you have an 8MHz ST, you can bet your bottom dollar that it will be *slower* at interpreting PostScript code than my 20MHz 68020 PostScript laser. Even a TT (a 32MHz 68030) running a PostScript interpreter could very well be slower than a fast PostScript printer, because the printers have the original PostScript code built-in and optimized on a set of chips, and that hardware is specifically designed for running the Adobe PostScript code. Your TT or ST isn't.

Traditional PostScript is, quite honestly, a programming language—plain and simple. Here's an example of a friendly PostScript program.

```
/Str
(We all LOVE Current Notes!)
def
/Helvetica findfont
20 scalefont
setfont
216 216 moveto
Str show
showpage
```

If we examine this, line-by-line, we see that the language works like I said it did; it's object oriented. In the first line, we're telling it, "Hey, consider the label Str for a second."

In the second line, we say, "And consider a string that says 'We all LOVE Current Notes!'" And in the third line, the "def" means, "We're gonna call that string Str."

Then we say, "Hey, look up the font Helvetica in your 'font dictionary'—I'm sure you have it." We then tell it to "scale" the font to a 20 point size, and that we want to "use" that font. We then instruct it, "three inches three inches moveto," (216 points is three inches) which will bring its "current position pointer" three inches from the left of the page and three inches from the bottom. Then we say, "Hey, remember that string called Str? Show it now at the current position." And then we say, "Hey, you know how we're talkin' about a page here? Print the page. Yes–on paper."

Very simple. This program will produce identical results on any Postscript printer, and the output will be at the highest resolution possible on that printer.

There is a new version of PostScript coming into wider usage now called PostScript Level 2, and it, among other things, allows the encoding of the simple ASCII (meaning plain text) program into a binary, more compact format. This becomes an issue when we start getting 300 and 400K PostScript files. By converting the long-winded, simple minded ASCII program into binary, you might reduce the size of the file by half its original size. The only

PostScript Level 2 printers I know of are the new Apple LaserWriter IIf/g machines, a *nice* 600 dpi laser from IBM, and the DataProducts LZR-960. There is currently no way to take advantage of the features of PostScript Level 2 on the Atari at this time. So why mention it?

I did say that "your average PostScript (level 1) file was around 200K." Then I said that some PostScript files might be 300 or 400K or more. Well, in an ideal world, all PostScript files would be 200K. When you use a Macintosh with something like *Pagemaker* or *Quark Express*, you'd have to work pretty hard (by including lots of graphics) to get a PostScript file that's more than a couple of hundred K. But on an Atari, using *PageStream 2.1*, it's not hard at all to get PostScript files that run **well over** *one and two megabytes.* The crowd breathed in sharply and reared back, aghast at the gargantuan proportions of what he had suggested—indeed!

What's the deal? Why should these files be so big? The answer is dumbness. One of the accessories (which I mentioned earlier) which is part and parcel of a PostScript printer is its Font Dictionary. A standard PostScript laser printer, ever since Apple made its LaserWriter Plus, contains the "standard 35 PostScript fonts." (They lie; it's not really 35 fonts. It's really standard, bold, italic, and bold-italic versions of Avant Garde, Bookman, Courier, Helvetica, Schoolbook, Palatino, Symbol, and Times. All those versions add up to 35 *fonts*.) So, when you turn on your PostScript printer, it will certainly know about these fonts.

Here's where we get to my printer's hard disk. The hard disk stores *additional* fonts that can live in the printer's font dictionary. There are programs which will download Adobe Type One PostScript fonts to the printer. And they can live either in the printer's RAM (which means the fonts will dissolve when I turn the printer off), or they can live in the printer's hard disk, so that every time I turn the printer on, the font will be ready for me. Sure, I don't need a hard disk on my printer, but it means that I don't have to spend ten or fifteen minutes downloading the Type One fonts I want to use, every time I turn on my printer in the morning.

The reason I bought this printer with the hard disk was that I wanted to simulate the conditions present down at Rick Speaks' place. He's my local service bureau—the place with the Linotronic Imagesetter, and his company is called Stuff, Inc. But anyway, I wanted my printer to differ in only one small way from his: resolution. That way I could be assured that if my files would print on my printer at 300 dpi, they'd print on his at 1270 or 2540 dpi. That's why the printer has the hard disk. I wanted to store all the same fonts on *my* printer's hard disk that I'd be using on *his* printer's hard disk. And our printers work the same, even Steven.

You should know something about Rick. Apparently, Rick doesn't feel he has to work for a living. He's very standoffish. He's very difficult to talk to. And he *hates* my Atari with a passion. He *hates* PageStream with a passion. There was one time last summer when I spent a whole day down at his place, poring over a scroll of PostScript program code, trying to figure out why my tabloid-sized *Current Notes* two-page ad wouldn't image properly on his printer. It worked great on my *previous* PostScript laser. Suffice it to say that I can't get him to print any jobs for me without him making some kind of cut on *PageStream*. I just ignore him and disregard him as the MacSnob that he is. But it got under my skin and made me wonder why I couldn't get my PostScript files down to a more manageable size.

Not only did my files not print in my early Imagesetting days, but when they did print, they seemed to take an awfully long time. Rick allows four minutes for his system to send and image an 8.5 x 11 page. For some reason, some of my P*ageStream* files seemed to take as long as eight or ten minutes for a single page. And he charges a penny per second for every bit of time over the allowed four minutes. So if he charges me $5 for a standard 8.5 x 11 page at four minutes, if it took eight minutes, he charges me $7.40. And when you sometimes print out fifty some pages, you don't want to pay an extra $120, and get sneered at to boot!

It turns out that the reason *PageStream* takes so long to print is that when you use Adobe Type One fonts from within *PageStream*, rather than asking you, the user, what fonts are built-in to your printer (or stored in its memory or on its hard disk), it assumes that your printer doesn't know about Type One fonts *at all*. And every time you go to print to a PostScript printer, and every time you captured a PostScript file on disk to take to Rick's Imagesetter, *PageStream* includes ASCII copies of every Type One font used in the document.

A Type One PFB (outline) file might take about 30 or 40K in its native binary format on disk, but when you convert it into an ASCII-hex format, it can take up to *100K* in your print file. And that's a hundred thousand bytes you have to send to your printer, every time you want to look at your page! And if you have ten Type One fonts in a page, you're looking at sending your printer a *MEGABYTE* worth of font data alone, every time you send a page. We already said it would take several minutes to send a megabyte of data over a parallel interface! And if your page is very complex, with graphics or lots of text, you could be talking about sending your printer *TWO MEGS* of data! And when you bring a two-megabyte file to Rick to get printed on his Imagesetter, you're undoubtedly going to break the four-minute-per-page barrier and accrue what he calls RIP (raster image processor) time at the unforgiving rate of a penny-per-second. Totally bogus, dudes!

Bear in mind that Rick is a font pack-rat. He has a *BIG* hard drive on his imagesetter that stores every Type One font Adobe has ever made, plus some ones I haven't heard of. Doesn't it seem totally inane for me to:

1) Send Rick copies of fonts he already has on his printer's hard disk.

2) Have to carry around one and two megabyte files that *should* only be around 200K.

3) Get *billed* (at a penny per second) for the time it takes to send Rick these fonts that he already has.

4) Repeatedly (in proofing) send my own laser printer copies of fonts that are already on its hard disk.

Without trying too hard, I came up with a solution to the first three complaints.

When you peruse through a *PageStream* generated PostScript program file, you'll see that every Type One font that you used in the document is neatly and regularly wedged in the file. They start with the header, "!%PS-AdobeFont-1.0" and end with the command "cleartomark." So I wrote a handy little program that will read-in the PostScript file, search for the senselessly embedded Type One fonts, and ask the user if each font should remain in the file. Then it will write a "fixed"version of the file, back out to the disk, which does not contain any Type One font that you deem unnecessary.

How you determine which fonts are "unnecessary" simply depends on what fonts your destination printer has online. If you know, for a fact, as I do, that your service bureau has every Adobe font, it isn't necessary for you to re-download the same Adobe fonts. If, though, your service bureau doesn't have some weird PD Type One font that you downloaded from a BBS, it makes sense to bite the bullet, keep the 100K of font data in the file, and include it. But even if you just remove two Type One fonts from your PostScript file, you've pared the file down by 200K or so, which ultimately could keep you in that four-minute processing window.

Another way to handle it, if your service bureau would like to download the fonts you're using into their Imagesetter's memory (or hard disk—and you should recognize that you're breaking copyright laws by doing this with commercial fonts), is to give your local Rick a disk that has all the esoteric fonts you're using for a set of pages beforehand. That way, he can download the fonts *once* to his printer, and you can remove *all* the Type One fonts from your PostScript program files. So if you use "Cheese-DisplayFace" in six of your documents, you don't send the font six times, only once, in the beginning. And he probably won't count the font download time as "RIP" time; he'll think it's perfectly natural that you'd need to download a few fonts. MacPeople do that sort of thing all the time.

Another workaround for this problem is to simply put all six of your document pages into one document, and to print all six pages into one PostScript file. But unfortunately, there are bugs in *PageStream* that cause unpredictable things to happen when you do this. Sometimes frames are rotated at random. Other times, you'll find frames missing, or inexplicably overlayed on other pages. I don't print more than two pages at a time into one file, and I've had good (if mildly verbose) PostScript results.

Gee Dave, That's Such a Big Hassle! Why don't you use Calamus?

Going to an Imagesetter using *Calamus* is even *more* of a big deal than when using *PageStream* (if you can believe that!). You see, *Calamus* doesn't speak PostScript, really. That's one of the reasons it's so darn fast when using an Atari laser. By using proprietary font and graphics encoding, it can compute the 1MB worth of bitmapped page data required for the Atari laser on an 8MHz 68000 in just a few seconds. But recall that a bitmap of an 8.5" x 11" page on an Imagesetter at 2540dpi is 75MB of bitmapped printer data. You *don't* want to send that to an Imagesetter over a Centronics-type parallel interface!

So, what the swell folks with DMC in Germany did was make a raster-image-processor hardware and software combination that allows an Atari ST running *Calamus* to send the Imagesetter that 75MB of data over the high-speed DMA port, so it gets sent basically as fast as the computer can create it (real fast.) This is a great system. It's the same idea as the new Goldleaf Imagespeeder system (which uses a TT as a printer interface). But the problem here is that unless you *own* an Imagesetter, (which will set you back a good 40,000 bucks), you have to *find* somebody who has an Imagesetter who has an ST/TT attached to it, who has the *Calamus* hardware and software interface, you're not going to be able to get Imageset output without going through the mail. *Good Luck! That sounds like real fun.*

I have heard of only a few places in the entire United States that have such a setup. None are near me in Annapolis, Maryland. Not only that, but quite frankly, *I Like Adobe Fonts.* There are lots of them! They're pretty. *Calamus* doesn't use them. I don't want to give them up!

Other Issues

I mentioned that I cured all but my fourth complaint in my list of PostScript woes. If you recall, the fourth complaint was that I had to repeatedly send the same fonts when I was proofing my documents from within *PageStream*. (Alternatively, I could print the files to disk and then run my program on them to remove the fonts and then send them to my printer, but it hardly seems worth the hassle; I'm not being billed for the print time.) Ideally, *I wouldn't have to send any Type One fonts, ever, to my printer from PageStream.* It would be swell if I could just tell *PageStream* "Hey, don't send that font." Or maybe *PageStream* should use a file that indicates which fonts should be downloaded.

The way it's *supposed* to work (I looked it up in a PostScript programming book) is that the printer interface should be bidirectional. The application (*PageStream*) should be able to ask the printer, at the start of a given work session, "Hey, printer, what fonts do you have online?" The printer would tell *PageStream*, and then *PageStream* would know not to send any fonts that the printer already knew about. But unfortunately, the parallel printer port, which has become the defacto printer communications standard on the ST, isn't bidirectional. And even if you go through the serial port, which certainly works, *PageStream* still does not query the printer for on-line font information. So the effect of using the serial (RS232) port is the same as using the faster parallel port: the blind transmission of unnecessary fonts. Ours is not to reason why.

I hope and pray nightly that a press release I read last year will come true. I heard that SoftLogik had an Appletalk printer driver in the works. Since almost every PostScript laser speaks Appletalk, and because the TT, Mega STE (and new Falcon) are capable of speaking Appletalk, it is the ideal interface for the next generation. Not only is Appletalk faster than any other currently available Atari print protocol, (along the lines of a few hundred K per second), it would allow the kind of controlled, interactive, reliable communication necessary for *PageStream* to query its printer about font information. It would also

open up *PageStream* to network printing.

Please, Deron, save us all. Make smart font-downloading a part of the new Appletalk system! Support PostScript Level 2. Fix the PostScript driver to print more than two pages at a time correctly. These are just suggestions; don't let us get you down. *PageStream 2.1* is an excellent program that I *still* love to use, even after being exposed to the somewhat less quirky mainstream alternatives.

Other Type-One Gripes

Now that I wrote my handy little font-removal program, Rick's bitching and moaning about *PageStream* is less. I brought almost all my two-page PostScript files to between 100 and 400K. I only incurred a little bit of rip-time on one page, which had some complicated graphics. I'm happy, but recognize the absurdity of this *new and improved* scenario:

Now, when I create a PostScript file, I have to run it through another program to surgically remove half of it.

Why not do this the easy way and get *PageStream* to print a PostScript file that's half as big?

That's my plea to you, SoftLogik. Make this reality. End my hell. I'll be releasing my program into the public domain in a few days. It's a stupid, hare-brained little program whose basic function could just as easily be accomplished with a text editor—it just helps speed things up a bit. I let you use the mouse with alert boxes to choose which fonts to "keep" in your file. I will try to talk Joe into putting the program onto an upcoming PD disk. And I hope that my program will help some of you lower your rip-time bills.

Now, of course, it's perfectly possible that I've just gone about all this the wrong way. Maybe someone else has a better idea on how to solve the "too many fonts" in the PostScript file problem. There are manipulations and negotiations that can be made using ".PSF"files, and the "FONTEQUIV" file which will cause specified Type-One fonts not to be downloaded at print time. But they almost always involve coming up with entire families of hard-to-make "decoy" font files which will "fake-out" *PageStream*. I don't think that anyone has a solution which is as simple as it should be, which is to be able to say, "Hey *PageStream*, just don't download these fonts."

There's the issue of Type One font screen redraw speed. Because *PageStream* does not cache Type One fonts, and because of some other dumb things in its code, Type One fonts take entirely too long to draw on-screen, especially at small point sizes. A page worth of 10 point Type One text might very well take two minutes to draw on-screen, even on a TT030 with a 19"monitor. (The comparable CompuGraphic or bitmap font takes only a few seconds.)

The solution that SoftLogik proposes is to use what's called an "ABF"file, or Adobe Bitmap Font file. They slightly speed up Type One redraws, but it's still nothing spectacular. ABF's are hard to find. There are some PC programs that will create ABF's from the PFB (outline) files. Don Turnock's new version of *BitMaker* will also create ABF files, but recognize that Type One fonts are an incredibly diverse family and some fonts, which may not be drawn in an entirely orthodox fashion, may give *BitMaker* (or similar programs) some trouble.

Another way out might be for SoftLogik to begin caching Type One fonts, to create bitmaps in memory when a font is first used, and to give the user the option of downloading the font. This way, all Type One problems are addressed.

1) Small point-size text is cached and drawn using the computed bitmap font that's in memory.

2) Large point-size text is created from the cached Type-One outline.

3) Type One fonts would not, then, be unnecessarily downloaded to your printer or your PostScript file. (Interactive querying of the printer could make this even smoother.)

PageStream has some other dumb "features" that slow down screen redraws. The FontList file is sorted after every keystroke. The FontEquiv file is consulted after every keystroke. That's dumb. That kind of thing eats processor time. I understand Deron fixed that in *PageStream 2.2* for the Amiga. Maybe 2.2 will be out soon for the ST/TT.

Perhaps Deron could find time to support PostScript Level 2, also. This would mean that even if you did have a large amount ofPostScript data to download, binary compression would cut it down to a more manageable size. And Appletalk transmission would make that even faster.

Only when all of these changes are implemented will Type-One font usage become as easy, fun, and fast as it could be under *PageStream*. That's not to say it's unusable. It could just be so much nicer.

Contact Me!

If you have any great experiences or suggestions for the general world (or me) regarding Imagesetter usage, *PageStream*, *Calamus*, or anything else, please contact me. I would love to hear from anyone who might shed some light, and I promise to reprint constructive comments here.

For anyone who's totally lost as to why anyone would want Imagesetter output, and thinks 300 dpi is just fine, they could be right. But take a look at this month's Toad Computers ad (centerfold). I go to a fair amount of trouble to show off the beauty of Imageset output in those ads, and for one thing, it lets me make those nice 11 x 17 pages. I think you'll find it's worth your time for some work.

So here we are. We're making the trek. It's a long and punishing road, filled with double standards and inconsistencies. But we're making it work. We're getting output. I don't want to commiserate, but rather clear the air and start a forum where we can iron out some of these very complex and confusing printing issues. If you have anything to say about this topic, *please* contact me.

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Ins and Outs of Multitasking

The Junkyard Pussycat

by John Barnes

Multitasking for the Masses

The Junkyard Pussycat's piece on multitasking in the March 1992 *Current Notes* was offered partly tongue in cheek at a time when rumors of an official Atari solution were just becoming prominent. In early April, Atari demonstrated MultiTOS at the Toronto show. Adventurous Atarians should be installing it in the not too distant future, and it may be the only game in town for the purchasers of Atari's new generation of machines.

The Pussycat thinks that real multitasking is worth a closer look because it offers so much potential for empowerment to serious Atari users.

What Is Multitasking?

Computers that multitask have the ability to perform more than one job at a time. In the desktop world this results from much skillful deception. The hardware and software are actually parcelling out resources to one job at a time in a way that makes it look like all of the jobs are progressing toward completion. Each job does a little work and then yields so the system can give the next job a crack at the CPU cycles, the DMA bus, the serial port, the floppy disk drives, the screen, the keyboard, etc.

Computer engineers have long recognized that different parts of their machines do things at different rates. Memory access is much faster than disk access, the serial port is much faster than the keyboard, etc. Why not allow another job to have some of the action while waiting for completion of some slow activity for the current job? The dream has been present ever since computers switched from vacuum tubes to transistors, but the Pussycat does not recall seeing it implemented on mainframes until the mid 1960s. The earliest minicomputers lacked multitasking but it was certainly widespread by 1978, when the Pussycat first encountered it in a microcomputer.

OK, But Why?

From his limited experience with multitasking using VAX/VMS, MultiFinder, and now UNIX, the Junkyard Pussycat believes that this is a technology that people who use Atari computers for productive purposes will lust after because it will enhance the power of their software and hardware arsenals.

Atari Corporation may believe (and the Pussycat will agree) that multitasking is a matter of survival. Without it they cannot claim credibility in the marketplace. Multitasking would also open up new ways for developers of entertainment software to build new excitement into their products.

As Macintosh users have already found, multitasking is addictive. It will open up the market for memory expansions, video upgrades, accelerator boards, hard disk drives, and a variety of other add-ons that people will want to satisfy their lust for power. People who bump up against the limits afforded by add-ons will be eager for more powerful computer systems.

Productivity Enhancement

The feeling of raw power that a computer user possesses when he is able to jump out of a running application and start up another one on the same machine on the same screen simply has to be experienced to be appreciated. The sense of well-being that comes from watching a background job hump along on its assigned duties while the user does something else gives a real rush.

Why should the machine be tied up for a half hour talking to Compuserve at 2400 baud when a deadline is looming? Why not jump into *WordPerfect* while *QuickCIS* is gathering the latest news and library files? Once a *Calamus* document is in final form, why not balance your checkbook while waiting for it to print out? Why shouldn't your computer be able to receive a FAX transmission at any time while doing something else?

Over the years, Atari users have come to rely on a variety of funky little tricks to achieve many of the things that are second nature in a multitasking environment.

Desk Accessories are one example. When a user can open another application from the desktop or a popdown menu while inside a running application the distinction between desk accessories and applications becomes irrelevant. Need to look up an address? Just open up the address book. Want a graphic? Scan it in, polish it up, and paste it onto the page without repeatedly closing and opening applications.

The need for TSR (Terminate and Stay Resident) programs is essentially eliminated because their tasks can be performed by normal applications that can be launched and shut down at will.

Memory partitioners like *Revolver* or *K-Switch* will be history because the multitasking systems will take care of the same needs much more smoothly. Print spoolers become just like any other application and will be able to purr away long after the application that created the document has been put to bed.

MultiFinder As Metaphor

The Junkyard Pussycat's conviction that many Atarians will love multitasking once they get it come from his experiences with Apple's *MultiFinder* for Macintoshes. *MultiFinder* is an especially apt metaphor for Atari multitasking because the arrangement of the desktop is similar to that offered by GEM, the applications have a look and feel that is similar to GEM, the CPUs belong to the same family, and Atari users can experience it today if they are willing to install a Spectre GCR. The Pussycat has no experience with Microsoft *Windows*, but some of his Atari-oriented friends have criticized it heavily. While millions of copies have been sold, the Pussycat spied only a few machines that were running it in a recent quick look around his place of employment.

Command-line oriented multitaskers along the lines of *MT C Shell, Minix, OS/9*, etc. have already demonstrated a strong lack of appeal to Atari consumers. *MultiGEM* and *SLICCTop* do not appear to have realized their developers' hopes because they limit the user's choices too severely. *MultiFinder*, on the other hand, is very nearly as natural to use as GEM itself. Double-clicking on an application or a related document launches it. Document windows can be easily moved and resized, and most applications will deal with several documents at a time (something that is not as common in the Atari world).

The topmost window on the desktop enjoys a special status because its parent application gets to take over the menu bar at the top of the screen. Jumping from one opened application to another is a simple matter of a single mouse click on an open document window. If a running application lacks an open window, the user can select the application from the drop-down desk accessory list or by repeated clicking on a tiny icon on the far right end of the menu bar.

Applications that are in the background keep right on running if they are so inclined. The most dramatic examples are terminal programs, which are particularly well suited to such operation because their data comes in so slowly. Printing of documents is handled by an application named *Print Monitor*, which is activated whenever a document notifies it that it has data to send to the printer. The data is queued up very quickly, even for fairly long documents, so that the user can get back to business while the printer chugs away in the background.

Sharing memory is a bugaboo of any multitasking system. *MultiFinder* provides a simple means for the user to specify the maximum amount of memory that an application can reserve to itself. Applications that are launched without enough available memory are usually polite enough, asking permission to run in whatever amount of memory is available.

As *MultiFinder* gains wider acceptance the emphasis on desk accessories decreases, but some of them, like the *Control Panel*, for customizing device drivers, and the *Chooser*, for selecting which printer to use, would seem to retain a unique status. Desk Accessories are still handy on those occasions when the user wishes to revert to a non-multitasking environment (the regular, non-Multi Finder).

While the internal gadgets (menus and tools) used by applications are unaffected by the presence of multitasking, the developers have taken care to display them and use them in a consistent manner. The "suits" at Apple have probably given them a lot of help on this. Moving from one application to another is, therefore, very intuitive, a matter of some importance when the switching is done frequently.

Networking is another area that is second nature to *MultiFinder* because file transfer server programs can be launched and pushed into the background, awaiting a call from the client program on another machine.

Thorns Among the Roses

The Pussycat has painted a nice, rosy picture of a machine humming along printing out its documents, exchanging files with other machines, and displaying a nice graphic interface to deal with documents of immediate interest. He has, however, gotten a thorn or two in his paw from time to time.

Some applications, once launched, will not yield to others. This is particularly true of things like disk archivers and backup programs. This is probably inevitable because these programs may go bonkers if the file system is not locked while they are running. Disk Formatting is another activity that seems to grab the entire system. Certain HyperCard stacks are also rather ugly about sharing resources while they are running. Certain timing-sensitive applications may experience timeouts and error off when another application hogs the whole machine.

Poorly written applications will also crash, thus trashing whatever is going on and necessitating a cold boot. The occasional "Application has Unexpectedly Quit" message is also a little disconcerting. Clearing this problem up often requires a cold boot, but it does allow a graceful shutdown. Crashes are ugly if they corrupt the file system on a disk, and the Mac file system has a reputation for sensitivity to this. Asking (inadvertently) two applications to share the same serial port is virtually certain to cause a crash.

It is generally not possible to switch applications while a dialog box is waiting for service. The remedy

is to cancel the dialog, go take care of other business, and then reinitiate the process that led to the dialog.

The performance of any one application can be degraded severely when there is a lot of activity in the system. One example is *After Dark*, an elegant screen saver implemented as a Control Panel device. Turning this off will speed up file transfers using Kermit by as much as 50 percent. Heavy network activity will also slow things down and will, in turn, be slowed by demanding foreground applications. It is reasonable to expect that FAX transmission and reception may face problems, particularly on machines that cannot keep up with high baud rates for FAX modems. The user should stay alert for such problems, and exercise a little care by turning off applications not needed.

With its propensity for launching multiple applications and its need to do an awful lot of bookkeeping, multitasking chews up memory like it was going out of style. Screen clutter gets to be a problem that can only be solved by a large screen monitor, which needs yet more memory and more CPU cycles to service the extra pixels. Bringing the display speed back up to sensible levels and servicing a lot of open applications demands greater speed from the CPU, memory bus, and DMA devices.

The continuing upward spiral in microprocessor capabilities we are seeing is being driven, at least in part, by a demand for more responsive multitasking.

What About Atari?

It should be noted that 68000-based Atari computers are capable of multitasking at this very moment. Versions of UNIX have been running for years on 68000 based machines that have roughly the same capabilities as the Atari ST line. *MultiFinder* has likewise been running on Macintoshes (and ST's under Spectre) for several years now. The question is no longer "Can it be done?" but, "How well can it be done?"

Savvy users say that *MultiFinder* does a rather poor job of multitasking and that *Windows* is a kludge. The Pussycat responds "Be that as it may, they work for many, many people and they are improving rapidly." Multitasking with a graphical user interface is here to stay and the price is dropping rapidly.

The failures of previous attempts at Atari multitasking have taught us that those users who are willing to spring for multitasking want a system that lets them take advantage of the smooth user interface that they have grown to love at a cost they can afford.

Furthermore, a candidate multitasking operating system for the ST must support a wide range of already existing applications, particularly in the productivity area; it should not take up an inordinate amount of disk space; it should not bog the machine down; and it should be easy to install. Examples of multitasking operating systems that fall into the "widely ignored" category include *OS/9, Minix, MT C Shell,* and *MiNT.*

OS/9 and *Minix* are two UNIX look-alikes, but they suffer from the use of file systems that cannot be read by normal TOS applications. Beckemeyer Development's *MT C Shell* has seen some application in business applications, but most ordinary users would be repelled by its UNIX-like look and feel.

MiNT, written by one Eric Smith, is a public domain product that the Pussycat has found somewhat daunting to download, configure, and install. *MiNT* is in the *Current Notes* library (see the May issue, and look for disk 683D). A few people have had experience with it, but the Pussycat has not gotten any observations on their experience.

MiNT is important because it forms the nucleus of Atari's *MultiTOS.* The product has seen a lot of evolution, particularly with the help of Atari's Allan Pratt, so that we can expect a polished product.

Culture Shock

Atari users will probably experience a certain degree of culture shock as part of the price of admission to the world of multitasking. Installing the software may prove to a considerable chore. If the software is on ROM the user will have to buy a new ROM set. This may be difficult to install in older machines, which represent the bulk of Atari's installed base. It is virtually certain that some favorite applications will fail to run properly, necessitating a fallback to single tasking until the application is fixed or replaced.

Will the developers be prepared to fix broken applications or will the user be forced to invest time and money in new ones? Will the new systems prove attractive enough to lure new developers to replace those that have fallen by the wayside?

Many users will chafe under the speed degradation and find that they have to compromise between convenience and responsiveness. This may not be too bad for users of 68030 machines, but users of STs clocked at 8 MHz may just throw up their hands and say, "It ain't broke, I ain't gonna fix it." 16 MHz users may find that things are not as smooth as they were before.

Then there is the matter of disk space. Are the people who have resisted hard drive purchases to date finally going to break down and spring for the units they need to store the applications, fonts, operating system software, and documents that they want to work on? And, what about screen clutter? What kind of video upgrade will be needed to provide the kind of visibility that is needed for efficient work in this complex environment?

The "avoid version x.0" syndrome is bound to hold a few people back. It is always better to let someone else do the beta testing, no matter who is selling the software, and this is especially true with respect to operating systems.

A Turning Point

While multitasking has been on Atari's plate for a long while, its introduction appears to be coming at a time when Atari is also bringing forth a new family of hardware products employing the 68030 and 68040 chips, which offer significant advantages for accessing more memory at a faster clip while including tools for memory protection. All of these features enhance the efficiency of multitasking.

If these events occur close together in time, or even in tandem, as the Pussycat fully expects, they will mark the biggest jump in capability that Atari has offered since the ST line was introduced in 1985. Expect teething problems and interesting times. Every computer manufacturer experiences such things at times like these.

The Pussycat offers the following suggestions:

1). Follow Apple's lead: Offer an initial version of the multitasking operating system as a download on the online services. To keep the phones from ringing off the hook, technical support should be provided only via the online services. After all, the people who are using the software under these conditions are doing so of their own free will with virtually no monetary outlay. If they are dissatisfied they can go back to what they were doing before. This should identify bugs and applications that need fixing far more exhaustively than Atari could with limited in-house resources. How many versions of its system software did Apple work through to fix bugs?

2). Demonstrate faith in the new hardware. Make absolutely certain that it is ready for prime time when it is rolled out. People who want to buy the new hardware should be able to get it right away and it is not fair to dealers to let people delay purchases in anticipation of something better right around the corner.

It can be argued that step 1 will deprive Atari of a lot of sales because there will be little incentive for the users to buy an upgrade when Atari offers it commercially. The commercial product will be different from the online product because it will have been greatly improved by its exposure to the real world. Support for the online version will undoubtedly be frozen shortly before the release of the commercial product, and support for that can be limited to licensed users, thus providing an incentive to buy. Sales should actually improve because the product will be familiar to many people who will want the best possible version.

Atari users are notably reluctant to buy a pig in a poke, as is witnessed by the number of them who have not upgraded to TOS 1.4 claiming that TOS 1.0 is not broken.

Atari is taking bold engineering steps by committing to such far-reaching changes in its product line. Let this be matched with a similar boldness in the marketing and delivery.

STARTING BLOCK

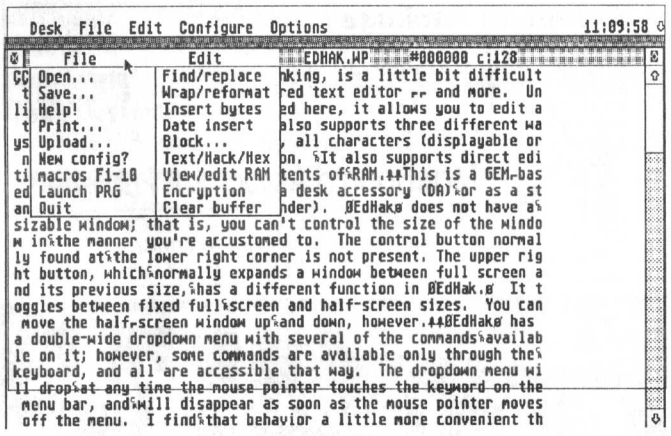
by

Richard Gunter

Text Editor Accessories, Part II

This is the first column I've prepared with *Calamus*—now Joe and Frank can stop badgering me to get with the flow. I've encountered a few things that I either don't understand, or which may be bugs, but its power is undeniable, and the printed copy outstanding. Screen redraws are a bit slow, but one of those 68030 boards just might bring warp drive into my ST's future. We'll see what the budget holds...

Meantime, let's get on with our examination of text editor desk accessories. We have two left in our list from last month: *EdHak* and the CodeHead version of MicroEMACS.



EdHak

EdHak is a commercial product from Clear Thinking (author Craig Harvey). It is a full-featured text editor that allows you to edit a text file of ***any*** size your disk drive can handle. It also supports three different ways of presenting the data and direct editing of disk sectors and RAM.

This GEM-based program can be run as a desk accessory or as a stand-alone program (PRG file extender). *EdHak* does not have a sizable window; the control button normally found at the lower right corner is not present. The upper right button toggles between fixed full screen and half-screen sizes. You can move the half-screen window up and down, but you cannot choose intermediate sizes.

EdHak has a double-wide dropdown menu with several of its commands available on it; however, some commands are available only through the keyboard. The menu will drop any time the mouse pointer touches the keyword on the menu bar, and will disappear as soon as the pointer moves off the menu.

"Hack" Mode

You can inspect a file either in the normal "text" mode or in "hack" mode. The latter allows you to see and edit all characters in a file. Hack mode allows *EdHak* to operate on files that use a CR alone instead of the CR/LF combination. (See discussion of *NotePad* in the May article).

You can also display the contents of the buffer in hexadecimal notation-especially useful if you're editing the contents of memory or doing direct editing of disk sectors. I'd prefer the more traditional side-by-side split screen showing character interpretation and hex notation at the same time, but can live with the *EdHak* approach for occasional use.

I found the "hack" mode handy while trying to master *Calamus*. Suspecting corrupted text characters, I exported my text to an ASCII file and inspected the questionable region with *EdHak*. No unusual characters; turned out the problem was elsewhere. The whole test took less than two minutes with *EdHak*.

Editing and File Manipulation

EdHak's commands include my minimum set of requirements for text editors: search/replace, cut/paste, word wrap, and the like. It also goes beyond the basics, with cursor movement by word and line, line and character delete, and "delete to end of line" commands.

EdHak will maintain a backup copy of a text file—a valuable feature. Another is the "macro" capability. This is not a programmed series of commands; rather, it's an ability to store several (up to nine) character strings which can be inserted into your text with a single function key stroke. The tenth one is specialized to send a setup sequence to your printer.

Editing Large Files

EdHak breaks a large file down logically into segments somewhat smaller than its buffer, allowing a convenient overlap when moving from one segment to the next. When an operation takes you beyond the end of the current segment, you are prompted for the disposition of the current segment. The procedure works, although not as smoothly as a fully automated paging scheme.

It does take more work to do extensive editing on a large file than on one that will fit in the *EdHak* buffer. For that reason, I'd recommend configuring

EdHak for a buffer large enough to entirely contain most of the files you work with, reserving the large file capability for exceptional cases.

"Open" Architecture

EdHak's author is to be commended for using the Atari clipboard standard, and for publishing the means for interfacing *EdHak* with other programs. A signal example of this is Jim Ness' use of *EdHak* as an alternate text editor in his *QuickCIS* program. Another is that *EdHak* can be used as an alternative to *STeno* with the *Stalker* terminal program.

Other developers take note. Everyone in the Atari community wins when multiple products, especially from **different** vendors, can be used in a cooperative manner.

Some quibbles

Most *EdHak* dialog boxes require you to use the mouse if you want anything other than the default option. This requirement breaks the user's train of thought, forcing an annoying switch between mouse and keyboard.

I'd prefer that the most frequently used commands take fewer keystrokes, and I'd like to see a word delete feature (possibly my most used command). That operation takes four keystrokes.

HEAD_ED

The CodeHead Editor (from the CodeHead Utilities disk) is based on Micro EMACS version 3.9.

Possibly the most intense "power" user of a text editor is a working programmer. (You've got to get that code typed before you can test it, etc.). Such users want a lot of features in the editor they use on a daily basis. This editor is the one that Charles says the CodeHeads use, and they did some work on it to get it working they way they wanted. Get the idea?

The original EMACS (according to documentation for MicroEMACS version 3.10) was written at MIT for Digital Equipment computers, and many versions and clones have appeared since. In some circles, this is a popular editor, and those with prior EMACS experience should find the CodeHeads' version quite familiar. The major change mentioned in the *HEAD_ED* documentation is addition of the file selector instead of having to type the whole path.

Except for use of the file selector, *HEAD_ED* is entirely a keyboard controlled program; the screen is not a GEM window. A "read me" file is included on the disk with basic instructions on the commands. The file prints as 5 1/2 pages, of which four are a list of command sequences. For text editing, this editor is far more powerful than all the others we've discussed, and far less friendly for casual users.

In my experiments, I found that *HEAD_ED* didn't work properly with my normal system configuration; it does work with a stripped configuration, and with the CONTROL accessory and Hotwire installed. "Field stripping" the system and gradually adding items led to confusion—I think there's a fairly complicated interaction going on and I don't yet know what it is. Each time I thought I'd found the culprit, stripping the system back down and running with only the suspect program and *HEAD_ED* failed to confirm my hypotheses.

Multiple buffers (files), keyboard macros, case changes, string searches with wild cards (pattern matching), and lots more put this editor in a class matched only by the most powerful editors or high-end word processors. Some features may be unique; I don't have a copy of *Tempus,* which may be its only true competition in the Atari world.

Is *HEAD_ED* for you? Maybe; if you're looking for a text editor DA and you're a power user, and if you're aware of the complication due to the way it fragments memory and know how to deal with that. Is it for everyone? No. *HEAD_ED* is powerful, but may be just a little too complicated for casual users. I consider it more of a programmers' tool than a device for keeping notes and diary stuff.

The Bottom Line

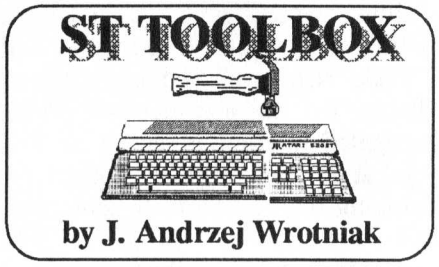
None of the freeware/shareware products we've discussed is really worth messing with, except possibly for *EdWin* if you're really RAM-starved.

Of the commercial products, either *EdHak* or *STeno* is sufficiently robust for everyday, fairly light usage. I'd love to see a program that combines the best features of both, but can recommend either without heartburn. *QuickCIS* users may be more comfortable with *EdHak* because of its easy use with that program; *STalker* users may be happy already, since I believe *STalker* is distributed with *STeno. HEAD_ED* is probably overkill for most people.

Accessory Editor Sizes (Revised)

Name	Free RAM	Size	KB
Baseline	3991988		
Edwin	3981740	10248	13
Notepd	3919698	72290	71
Word 400	3851022	140966	138
STeno (45K buffer)	3854618	137370	135
EdHak (45K buffer)	3841426	150562	148
CodeHead Ed	3787706	204282	200

Above data based on baseline configuration: Mega 2 with 4MBytes RAM, color monitor, TOS 1.4 with patches, Hotwire 2.3; no accessories loaded.



by J. Andrzej Wrotniak

Programming as a State of Mind

Show Me Your Data Structures...

Time is running so fast—the last *State of Mind* column dates back to the December issue. Time for the next one, if we want to complete this series of essays on programming before the end of this century...

Again, a reminder: if you do not do any programming, still stay with us (going back to the previous installments might be helpful, though see the Editor's box at end of article). After reading this article you may gain some additional insight about how the programs you use work.

In the Old Doctor's Office...

We still can see those things in the movies: an old office would have nice teak cabinets full of cards with data on patients, customers, transactions and such. *Wendy, dear*—the doctor would ask—*would you bring me Mr. Smith's card?* Or, *would you please* (they really used to say "please" then!) *sort today's patients' cards by the date of birth?*

Please note: real-life objects (patients) were in this arrangement mapped into their respective *data objects* (cards, files). Operations on the former were reflected in operations on the latter.

This simple approach worked quite well, and it is very strange that it was not applied to computer programming through quite a few years (or decades) of this craft.

The first high-level programming languages (FORTRAN, Algol, BASIC) had quite rudimentary sets of data objects (see CN, July '91): numbers and text strings. This means that computerized data on, say, a patient, had to be represented by quite a few variables: first and second names (two strings), date of birth (three integers), last weight (a real number) and so forth.

What is wrong with this? I will ask my friend, a scientist who spent his whole life in FORTRAN and does not see much need for any of those modern gadgets. Well, really nothing, if you do not mind doing lots of mindless work with zillions of separate variables describing one object, and risking errors that otherwise could be easily avoided. Data structures do not really open any new possibilities (in programming, nothing does: you can do everything in machine language, and some even prefer to), but they make programming significantly easier, and greatly reduce the chance of errors.

The concept is, indeed, simple: introducing *data objects* on a higher level than just numbers, number arrays, and text strings. In other words, instead of coding *Wendy, dear, find me Mr. Smith's first name, date of birth, address, last weight, and the date of his last visit*, why wouldn't we use an equivalent of *Wendy, dear, find me Mr. Smith's record, please*?

Putting COBOL, the *Common Business Language*, aside (please, not before dinner!), it was only in Pascal, around 1970, where the concept of *record structures* was introduced (oh, yes, I have seen the Algol-68 standard, but not a compiler!). "Why so late," you might ask. "Were the early computer programmers a bunch of narrow-minded idiots?" Not at all (this is, however, rapidly changing; I have already met *industrial programmers* who did not understand what a variable is). The early uses of computers were, however, almost entirely in science or engineering, and most early computer programs were not much more than literal coding of math formulas, which could be quite well expressed with the use of just simple variables (numbers) or numeric arrays (vectors, matrices).

Stage Three: Record Structures

Stage One was just numeric objects, Stage Two - arrays, i.e. series of the former, with individual members identified by a subscript, e.g. `X[5]`, the fifth numeric object in array `X`. Now it is time for Stage Three: record structures, known as *records* in Pascal, Modula-2 or Ada, and as *structures* in C or C++.

Usually, first you have to define a *record type*, like a patient card pre-printed with all the fields to fill in. For example, a record type designed to describe a car (in not a very complete manner, so what?) could be defined in Pascal as

```
TYPE Car = RECORD
   Model: STRING[40];
   Power: REAL;
   Weight: REAL;
   Doors: INTEGER;
   END;
```

or in C (or C++) as

```
struct Car {
   char Model[40];
   float Power;
   float Weight;
   int Doors;
   };
```

One has to be blind not to see similarities between both languages (some people are—and they are still arguing which of the two is a complete dog).

Once a record type has been declared, we can use variables of this type, declaring them very much like variables of the pre-defined types:

```
VAR yours, mine: Car;
    stock: ARRAY[1...2000] OF Car;
```

or

```
Car yours, mine, stock[2000];
```

(with differences between Pascal and C almost purely cosmetic).

The first level of what is being called *data abstraction* (to intimidate people like you and me) is just the possibility of handling a **Car** as one object. If, for example you bought the 27th car from the dealer's stock, the corresponding line of the Pascal program will be

```
yours := stock[27];
```

Now, in FORTRAN even this simple example would ask for a disaster. First, you would have to declare all data fields as individual variables, e.g.

```
CHAR*40 MYMODEL, YOMODEL, STMODEL(2000)
REAL MYPOWER, YOPOWER, STPOWER(2000)
REAL MYWEIGHT, YOWEIGHT, STWEIGHT(2000)
INTEGER MYDOORS, YODOORS, STDOORS(2000)
```

Now, to perform a simple buying transaction you would have to re-load manually all the fields:

```
YOMODEL = STMODEL(27)
YOPOWER = STPOWER(27)
YOWEIGHT = STWEIGHT(27)
YODOORS = STDOORS(27)
```

and many people may find this task menial, humiliating and degrading (things you can do for money, but rarely for pleasure).

By the way, most dialects of BASIC need a similar approach, although many do not require declarations. This may save some typing but creates opportunities for stupid bugs—try, for example, writing **Y0POWER** (with a digit 0) instead of **YOPOWER** (with letter O)—this will create a new variable, store your horsepowers there, while **YOPOWER** (with letter O), which you are going to use later in the program, still contains some rubbish.

(Use a debugger, says Bill. Well, if you have to use a debugger more than once a month, you are doing voodoo, not programming, my grandfather once said.)

Now, if you want to perform an operation on an individual field of a structured data object, you use a construct similar to "Mr. Smith's weight" in our Wendy example. For example, in Pascal you may write

```
Full_Wgt := yours.Weight+Gas_Wgt;
```

(assuming that **Full_Wgt** and **Gas_Wgt** are **REAL** variables), or, in C++, you may have

```
if (!strcmp(yours.Model,"Yugo"))
   cout << Wow!" << endl;
```

(The latter example needs some explanation. In C or C++ the "normal" == operator does not work on arrays or strings; array names are not treated as *objects* in C, but as their *addresses*, and if this is not annoying then tell me what is. Anyway, the **!strcmp()** thing stands for "if both strings are equal.")

What's the Big Deal?

All this does not look like much, at least not at first glance. Please note, however, that generally we can divide all operations concerning a composite object (like our **Car**) above into two groups:

- operations dealing with the object as a whole (assignment, swapping, moving, forwarding to other operations etc.)
- operations dealing with individual fields (attributes) of the object: modifying or accessing weight, model, power etc.

For the first class of operations, the internal structure of our object is entirely irrelevant. Changes in this structure should not cause any changes in the program code describing these operations. Assign **stock[27]** to **mine** and I don't really care what is inside!

If, for example, one day we decide to add yet another attribute to our **Car** structure, e.g. a **REAL** field **Mpg** (reflecting car's fuel consumption), our above examples in C and Pascal will require no modifications - just "give me the whole thing whatever it has inside." In FORTRAN or BASIC we would have to introduce the extra lines of code, like **YOMPG = STMPG(27)**.

A Personal Warning—Use Data Abstraction

Three years ago, I decided to modify my FORTRAN system for simulation of elementary particles propagating through Earth's atmosphere. A group in Notre Dame needed information, not only on the paths and energies of particles, but also on their arrival times. The Notre Dame campus inn had then a great chef, so I took a few days vacation from my crummy job and went up north.

It turned out that my code needed to deal with the time value itself in not more than three or four places, while operations on *whole* particles numbered a hundred or more, scattered all over the place. The former (physics) needed an hour or so to be modified, the latter (housekeeping)—three days of hard (and boring) work. And, of course, I missed one place; it took my colleagues a year to start suspecting anything, and then I had to take another trip the next year, just to find and fix one line of code. (In the meantime, the chef retired, and this is what happens when you do not use data structures.)

A digression: some more recent dialects of FORTRAN (VAX and Microsoft in this number) have introduced non-standard extensions to define record structures like those in Pascal, C or Modula-2. A simi-

lar feature (with somewhat different syntax) is also present in the new FORTRAN/90 standard—which, by the way, looks like a disaster, but this is yet another story.

Objects More Equal Than Others

In some aspects, user-defined record structures look very much like the "normal" variables of the pre-defined (e.g. numeric) types. In particular, they can be passed as arguments to procedures, as in

```
FUNCTION Better( a: Car; b: Car ):BOOLEAN;
```

or

```
int Better( Car a, Car b );
```

which (in Pascal and C, respectively) uses some algorithm to compare (whatever it means) two cars and return a **TRUE** (or 1) if **a** is "better" than **b**.

For unknown reasons however, Prof. Wirth, the designer of Pascal, stopped short of giving record structures all the rights pre-defined types enjoy. For example, a Pascal function cannot return a result of structured type. This is perfectly legal in more recent dialects of C (including the ANSI standard) or C++, where you can have a function declared, say, as

```
Car Choose( Car a, Car b);
```

and use it like

```
mine = Choose(stock[i],yours);
```

or even

```
if (Choose(mine,yours).Weight>4000.0) {
  ...
  }
```

(In the last case the program will create a temporary nameless variable of **Car** type, store the result of **Choose()** there, then take the result's **Weight** to compare it against 4000.)

To work around the Pascal limitation we can write **Choose()** as just a procedure:

```
PROCEDURE Choose( mine: Car; yours: Car;
VAR choice: Car );
```

where the result is returned via the third param eter—this is why it is declared as **VAR**, while the first two *could* have been **VAR** just to save some space and some execution time (if this is not clear, see the December '91 issue). Our C examples of procedure calls could then be translated as

```
Choose(stock[i],yours,mine);
```

and

```
VAR temp: Car;
...
Choose(mine,yours,temp);
IF temp.Weight > 4000.0 THEN BEGIN
   ...
   END;
```

Less slick, but basically the same.

Private Types and Fields

The record structures as in Pascal or C provide a significant convenience, allowing us to have one data object holding all the various attributes of a real-life (or whatever) object it describes. Some would say, however, that this level of *data abstraction* is still quite low—individual fields of a structure can be accessed and manipulated from anywhere in the program.

Wait a minute, you may now say, this is going too far! Do you mean that I am barred from accessing fields of my own records? If I can't do that, then how the heck am I supposed to do anything with my data?

There are some advantages to hiding the internal structure of a data object from most of the program code, except of that designed specifically to manipulate object's internal components. This may be best illustrated on an example (taken, by the way, from my work, with some modifications).

Imagine writing a program dealing with some geometrical problems on the (approximately) spherical surface of the Earth. One of the most needed data types will be a structure describing a single point on the sphere. As this is often done by specifying a point's angular co-ordinates, latitude and longitude, the following structure (in, say, C) may come into mind:

```
struct Point {
   float lat, lon;
   };
```

Then, for example, to set a **Point** variable **p** to 45 degrees North and 92 degrees West, we could write

```
p.lat = 45.0;
p.lon = -92.0;
```

and a function computing distance between two points could be

```
float Distance ( Point a, Point b ) {
   /* ...some ugly formula to compute a
float d */
   return d;
   }
```

Whenever your program needs the latitude of a **Point p**, it can be done in a quite straightforward way, by just writing **p.lat**.

It may happen that at some later time, after you have written a few thousand more lines of code, and after your **Point**-handling functions have been used by the remaining 23 programmers on the project in thousands of places, that you decide to change the internal representation of **Point**. Indeed, it turns out that it is much handier to do all the calculations if a **Point** is represented by not two but three real numbers, **x**, **y**, and **z**, a vector from the Earth center to our point. (This is true; most of the geometric formulas become much simpler and you gain a factor of five in speed, if not better.)

At this stage in the project such a change is, however, almost hopeless: most of the program expects **lat** and **lon** fields to be present in the **Point** structure, and the impact of modifications on the rest of the code would be prohibitive.

Solution in C++

This could have been avoided, if the **Point** data components have been declared as private. Among modern languages Ada and C++ allow for this; in the latter the corresponding declaration of the original structure would look like this:

```
class Point {
private:
  float lat, lon;
public:
  Point( float latval, float lonval );
  float Lat();
  float Lon();
  friend real Distance(Point a, Point b);
  };
```

Here **class** is just a buzzword like **struct** and means roughly the same. The word **private** means that the fields following it are hidden from all the program code except the functions specified members or friends (see below) of the class. Note that these specifications are included right inside the structure type declaration, in the **public** (i.e. externally accessible) part.

Point() is a *constructor*, being the only means by which someone may create a **Point** object. This can be done as in

```
Point p(45.0,-92.0);
```

where a **Point** variable **p** is declared and assigned an initial value, or in

```
p = Point(40.0,-99.5);
```

Next, **Lat()** and **Lon()** are *member functions* (sometimes also called *methods*) of class **Point**. The syntax of their calls is somewhat different than we are used to, e.g.

```
real d = p.Lat()-q.Lat();
```

Note that our **Lat()** and **Lon()** functions are very trivial—they just fetch and return a piece of data already there—although hidden and inaccessible via the "dotted" notation: using **p.lat** would be flagged as a compilation error. Thus, **Lat()** can be coded (in a corresponding .C file) as

```
real Point::Lat() {
   return lat;
   }
```

Finally, the word **friend** preceding function **Distance()** means just that this function is authorized to see and access private fields of the **Point** structure.

Obviously, if the structure fields (in C++ called *data members* of the class) are private, then it is up to the **Point** library programmer to provide all the tools necessary to manipulate them: constructors, member functions and friend functions. The C++ class definition (as above) is usually contained in a header (.H) file, while the actual working code is implemented in the accompanying .C file (irrelevant to any users of the Point class and frequently even provided only in a compiled form).

Now, imagine we want to modify the internal structure of **Point** so that it will store vector components. The new class definition may be

```
class Point {
private:
   float x, y, z;
public:
   Point( float latval, float lonval );
   float Lat();
   float Lon();
   friend real Distance(Point a,Point b);
   };
```

Note that all that changed was the private part! In other words, all program code using **Point** structures and the related functions will not require the slightest modification! The impact of our change is limited to just the .C file with class **Point** implementation: if I, the **Point** programmer, have changed the data members, then I am also responsible for appropriate changes in the functions, and nobody else in the system should even notice.

Obviously, the internal changes will be significant. For example, the **Lat()** function, previously requiring very little CPU activity, would now have to compute latitude from vector components, and this takes much more time. Similarly, while the old **Point()** constructor would just put **latval** and **lonval** into the proper fields, now it has to convert them into **x**, **y** and **z**. Still, **Distance()** and dozens of other possible functions will be much faster.

Welcome to the next level of data abstraction: private (or partly private) types.

How Much Privatizing Do We Need?

Here we are facing the same question as Boris Yeltsin in Russia. Obviously, private data structures (or their parts) make our programs more manageable and easier to modify. On the other hand, this comes with a price: extra overhead in calling functions that may be just fetching data elements. Drawing a line at the right level is an important design decision.

Some programmers may feel claustrophobic in an environment with a high level of data abstraction. They may prefer to leave all structure fields public and access them freely from any place in the program. Some, on the other hand, would put everything as private, whether needed or not. I think the right approach is somewhere in the middle. If the data fields are interrelated (i.e. if not every combination makes sense), then it usually pays to make them private. For example, in our last version of the **Point** structure, the sum of squares of **x**, **y** and **z** has to give the Earth radius (or just 1); they cannot be set to just any values. The **Point()** constructor can take care of it. On the other hand, if we are sure that the (lat,lon) representation in the previous **Point** version will never be changed, then the advantages of making the fields private are much

smaller and, depending on the application, may or may not be worth the hassle.

Can We Do It in C or Pascal?

Ada and C++ (I have somewhat mixed feelings about this language, with some of the most elegant and some of the ugliest features I have seen) provide explicit tools for controlling the visibility of structure fields (although in Ada only the whole type can be private, not just some of the components). Modula-2 goes somewhat less than half-way in this direction; its opaque types are limited to pointers and this is pretty cheap.

There are cases when, even in less advanced languages, like C or Pascal, it is worthwhile to *pretend* that the data object is a black box, and to manipulate its contents only by using the supplied tools, not directly. Yes, this is a self-imposed limitation, and it requires not only a high degree of discipline but also a bird's-eye approach to software design. It may pay itself back—especially in larger projects, not only those involving a team of programmers.

You can use data abstraction and object-oriented approach even in assembly programming, although higher-level languages make it more natural and convenient. I can make a safe bet, that the programmers of *Dungeon Master* extensively used data abstraction in a very organized way. I would really like to see their data structures!

It is perfectly normal that a programmer initially (in the first 20 years of work) underestimates the importance of the proper data structures. It is easy to see that the code should be organized the right way, but data is just data, right? Well, I have met quite a few people(myself in this number) who needed more than a decade to realize that code and data are two *equally* important sides of the same thing.

What's Next in Our Series?

We haven't even mentioned the more advanced object-oriented features, like inheritance. This will have to wait until another opportunity, a separate installment on object-oriented programming. First we will go into program modularity, and I would also like to present a short, layman overview of the "big" programming languages.

Your letters with remarks and suggestions make all this much easier and more enjoyable (and, besides, how else would I know that anyone in the world reads this stuff?). Until then.

Editor's Note:

This is the fifth in a series of articles published in *Current Notes* on programming called "Programming as a State of Mind." Earlier articles to appear in this series include:

1. Programming as a State of Mind, April, 1991.
2. What Does Not Make a Programming Language, May, 1991.
3. Data Typing 101!, July, 1991.
4. Procedures, Functions & Subroutines, December, 1991.

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Small World

Help Me on a Project?

by: David Small

Heavy Stuff

It's been winter here in Coloraddy, and I've been writing about Heavy Stuff. January and February went into a dissection of "C" (which some thought was an attack on structured programming, alas; it wasn't.) March was devoted to a hero, Gary Hudson, and his efforts on single stage to orbit rockets. (Still can't tell you what's up on that.) April went to a rambling walk about computerville, peering into the latest PC-clones and Mac-Machines and, essentially, falling to the ground in a giggling fit.

This has been heavy stuff! (Geeze, you should see the UNIX lynch mob ... fortunately, a fence-post error made their rope too short.)

Some Help

So I'd like to write a relatively "light," cheerful column, and ask your help if you know about the things I'm asking about. If you do, and would be willing to part with some knowledge (nope, I'm not asking for cash!), I would be really grateful.

It all started with a Camaro ...

You see, after getting Spectre GCR out the door, an experience I hope never to repeat (that GCR formatter ... mutter ... mutter), Sandy took me on a "toy-buying" expedition. It's a well known fact that the major difference between men and boys are the type of their toys; I was after a big boy's toy. I settled on an old "Classic Car" Camaro.

Alas, the engine in it was a real dog, from two years after severe smog regulations kicked in, and the whole thing had the performance of the N.E.A. giving writing grants for science fiction (it's never happened). So, we went engine shopping, and good ol' Burt Chevrolet was selling the LS-6, Chevy's fire-breather, in a closing-out sale. We bought one, had a 'Vette shop put it into the Camaro, and created a rocket.

I mean a rocket, like you may remember. If you push too hard on the accelerator, there's this strange high pitched noise and two black lines behind the car and tire smoke. It'll go zero to a hundred faster than you would believe...

I was after a big boy's toy ... an old "Classic Car" Camaro.

Now like any rocket, you're pushing tolerances closer to absolute limits. Everything runs hotter because the compression is higher and the engine is physically bigger, so the radiator has to work harder. The transmission has to stand up behind the Rat motor without its clutches slipping, or it'll rapidly become history. Gasoline can't boil or flash into mist in the fuel line ("vapor lock") because the engine compartment is so hot; wiring can't melt because the metal it's near is too hot, and so forth.

Eyes Under the Hood

So I need some instrumentation on this engine, roughly about the same amount they used to strap onto the Saturn V rocket so that they could at least know *why* if it blew up. I've been tricked once by this car; it threw the fanbelt, the GEN light didn't work, the ammeter is dead for some reason, and I ran the engine without a cooling water pump for a short while. The result was me almost warping the heads on a nearly irreplaceable engine! Now if I'd had an ammeter or a voltmeter, I could have seen the alternator go off-line as the fanbelt left; if I'd had water and oil temperature gauges I could have seen the engine overheating; and so forth.

I've also had to replace the battery. It got mighty old jump-starting the car every morning! I didn't really know if there was some drain in the car that was pulling it down each night, or if the alternator wasn't charging the battery well, or what, until I wired in at least a few instruments.

I also sort of enjoy things like running some inexpensive fiber-optic cabling from Edmund Scientific to the tail-lights to let me know if they are REALLY working (it's great!), and so forth.

All of which leaves me with no longer a driver's seat, but a cockpit; and no longer a view of the road I can keep my eyes on, but gauge after gauge to flicker my eyes over constantly. That cuts your safety down, because just as you're looking at the oil pressure gauge, some idiot slams on the brakes in front of you, and your Classic Car is now Classic Iron Oxide and not much else.

There's got to be a better way. And, of course, there is.

Computerize it

Cars ... this is a painfully obvious application for a computer.

There're already computers in recent cars, up in the fuel/carburation section. They monitor how hard you're pressing the gas, then try to feed in gas and air to give you power without causing too much pollution. It makes sense compared to the relatively crude gasoline control systems that exist, say, on my car, which are compromises and kludges the whole way through.

In fact, you can buy, no kidding, "Hot Rod" EPROMS programmed to give you more power from your car (at almost certainly more cost in MPG), and plug them into your car. Boy, is THAT a weird feeling for me ... I mean, burn a 2716 EPROM with numbers and pop it into a CAR? Whew. (Check the ads in Road & Track, Car & Driver, Hot Rod and similar magazines to find this sort of thing if you're interested; I would be if I were you.)

If you think about it, if we wire the sensors for heat, pressure, and so forth into a computer, the computer can sit and scan them over and over, in an infinite loop. It can generate a display if we want. And if something goes radically wrong--we overheat, oil pressure drops to nothing--then it can set off an alarm.

If I do this, I can remove all the gauges from the car (or tuck them away somewhere where my knees aren't whapping them and they're obstructing the view), and let the computer "watch" them by watching the electrical lines the gauge monitors. If something goes wrong, I'll let the computer warn me. (Of course, I'll keep some form of backup for when the computer goes down and splats).

This sort of concept isn't new for piloting areas. Most modern large aircraft no longer have banks of meters staring at you, a la the B-52; *they have very high resolution color TV's.* The TV's are drawn to simulate whatever gauges the pilot / co-pilot / engineer need to see. (Usually, of course, it's the artificial horizon, or on landing something like the ILS, Instrument Landing Approach system. Should an emergency crop up, the "avionics" selects the instrument the pilot really needs to see and pops it up there).

In fact, modern cockpits are so computer-driven that the auto-pilot does nearly everything from take-off to landing. Pilots complain a great deal about the amount of typing they have to do on their keyboards when ATC, Air Traffic Control, re-routes them!

Newer cockpits feature up to five ultra high-res color TV's, side by side, displaying whatever instrument they are toggled to, often touch-sensitive, able to bring up menus by touch in a single bound. It's amazing.

Well, let's assume I use an 8-bit Atari for the main computer. Why? First, I can program it, if my feeble memory allows it. (Let's see ... what does PHA do? Naw, it'll probably be BASIC in cartridge. It'll sure be fun trying to find my MAC/65 disks and ATR-8000.) Second, the Atari 800 machine is very inexpensive from an outfit like B & C in the Bay Area or American Techna-Vision. Third, very importantly, the machine has 4 ANALOG inputs in the joystick ports, meant for "paddle" controls. Fourth, I can find a TV and power supply to hook it into, and make it reliable. Sure, I could go embedded-controller. I don't want to; I would like an Atari in this car of mine that's part dream.

Analog and Digital

Here let me define something you might have wondered about. Electronics as an industry has been splitting into many directions. One of the biggest splits is between Analog and Digital. Let me explain.

Analog is best described by a fuel gauge. You look at and know that you have 1/4 of a tank remaining. It does not move in "chunks" (say, from 1/4 to 3/4) instantly; it crosses all the territory between.

Digital is best described by a turn signal. It is on or it is off. (If it is dimly on, you have a "short circuit" and have got problems!)

Computers are digital machines. They represent everything inside of them as either ON, usually represented by 5 volts positive (a bit like 3 flashlight batteries stacked up), or OFF, represented by zero volts. Now because electricity is inherently analog, and just loves to go back to being analog, it's really sort of a bitch to get electricity to "do" digital. Typically, you'll find "undershoot" when a gate goes from 5 to 0 volts; it goes to minus volts. Or a wire will "ring" from, say, 3 to 5 volts repeatedly when you switch to 5 volts. All of this is why digital circuit designers burn out and fade away real fast.

The analog designers of a computer typically do the power supply and the picture tube electronics; the digital people dothe computing section. Many people have said that the real success of the Apple][machine was its "switcher" power supply, which worked at low price, rather than anything else.

I do know that when an "analog" engineer (say, a TV tech) goes into digital, he ends up being very good. I was taught something of digital, and there's just a lot of gaps, things I didn't understand. What was a Vss anyway? (An analog guy told me: Voltage substrate). And so forth.

Back to the Car

Now what we want to measure in this car is analog stuff; for instance, how hot the engine is. A typical sensor gives back a varying resistance depending on the heat; you measure the resistance (or, measure the amount of voltage or current the resistance lets go through, which is about the same thing), and if you have taken the time to calibrate your measurements and find out what that electrical value means, you know how hot the engine is.

In fact, thinking about it, with 4 analog inputs, I would like to measure:

1) Oil Pressure: that's pretty critical to see fast if it should fade.

2) Oil Temperature: the temperature inside the engine, really. If things really go sour, this will pretty much tell you if the oil held its film together and kept the engine from scattering.

3) Water Temperature: can climb real fast if the water pump quits, or a leak develops.

4) Transmission Temperature: if the transmission is getting too hot, I'll want to install a cooler.

If there's a simple way to "multiplex" analog inputs (I know one called a "relay," really new technology (grin) but would enjoy learning Analog Switching Ways, as there are other possibilities for analog inputs:

A) Differential temperature- burning up the limited slip clutches?

5) (possibility) Car Voltage: tells you all sorts of interesting things about the battery, alternator, fanbelt, voltage regulator, and how it's holding up.

6) (possibility) Ammeter: if I could just figure out a way; see below.

7) (possibility) Gasoline Pressure: lets me know if fuel pump can't dump enough into the engine. More of a warning light than anything. I don't know where to get a sensor.

8) (possibility) Gallons-per-hour fuel flow meter: if I can ever figure out how to measure this. I might have to haunt an airplane spare-parts shop to find this; I remember a GPM meter on a Cessna plane I used to fly in... (any hints are welcome!)

8) (possibility) An RPM memory-meter: I know well they're available, and I could probably tap in at the meter movement, or even "roll my own" at the distributor points, with an integrating circuit of capacitor and resistor. Where I want the computer is recording the RPM curves while racing.

9) (possibility) An acceleromotor plotter: in other words, I do a quarter mile, and it plots my speed at each sample interval (1/4 sec?), plus the amount of acceleration. In this way, I can find out very quickly if something is restricting the car.

But how to measure the speed? It's an automatic, Turbo-Hydramatic 400 transmission, so I can't just pick off RPM and do the gear math. There is slippage. Nor are the rear tires necessarily going to be connected to the ground. (Although measuring how much they are slipping *would* be very useful).

All I can think of, right off, is some sort of LED mirror/sensor on a front wheel, where there is a strong infrared LED pointing outward, and a tiny mirror glued to the rim of the wheel; a photoelectric cell sensitive to the LED's frequency would pick up each spin and send it as a "1" to the Atari.

Then there are "digital" inputs. You get one analog input, for the paddle port, per joystick port on the 8-bit; but you get 4 bits worth of digital ports, provided what you want to measure can be translated into 0 or 5 volts. Fortunately, the car I'm wanting to measure uses a 12 volt electrical system, and 12 volts just happens to be the voltage that RS-232 uses for the world, so there are many 5 volt to 12 volt converter chips, like the MAX232 or its successor. I can pull the needed voltages out of the Atari's power supply.

I'd like, for instance, to make sure that all the turn-signal blinker lights blink when they are supposed to, to detect a burned out light bulb before the Colorado State Police pull me over. When I click on the headlights, I'd like things like the license plate light, the side lights, the tail and front lights to come on, as well. There are several ways to measure whether or not a light is working; you can run a fiber-optic cable and look directly (but we're trying to get away from that), or you can measure the voltage across the light bulb. If the bulb should be on, and there's too much voltage "not going anywhere," then the light bulb has burned out, isn't screwed in right, or whatever.

There are also other useful straight digital inputs. I can string solder (yes, just plain solder) near the carb and fuel lines, and if it ever melts, I've got an engine fire. At that point, the Atari needs to yell Essential Bloody Murder. Same thing goes for a flat wire-break in essential places, like the alternator.

The 16 digital bits from the 4 input ports come into a PIA 6520 chip, which I can program in my sleep (I got REAL good at it hooking up a Corvus hard disk to an Atari 800 through the front ports; I should have made a floppy disk design that worked that way. It was *fast*; it still works great.) You just simply set the bits for input and PEEK() them. Or, you *can* set them for output and POKE a value into them, if there is something you'd like to control (like, say, turning off the green L.E.D. and turning on a red L.E.D. in the instrument panel to tell you something's gone wrong!, and to tell you to look at the Atari's TV monitor to see what real soon, or to switch a relay.

The four analog ports work a little differently (and interestingly!) When the TV begins displaying a new screen, line by line, as it starts at the top, a little capacitor (or storage area) is zero-volted out. It is allowed to gradually, slowly charge up as the TV displays the screen; it's half-charged or so when the Atari is halfway down the TV screen. When the Atari is done, the capacitor is all the way charged up.

What's handy is there is a circuit in there that when the voltage in the capacitor matches the voltage on the analog port, the scan line number (from 0 to 255; there's really only 192, but we won't tell) is written to a hardware register, where you can "PEEK" it.

Incidentally, I may not remember these details accurately; check them out in an Atari Colleen/ Candy hardware manual before relying on them. Something about that analog circuit is still nagging at me; perhaps the charging goes on through the game port potentiometer, and the Atari records when it passes a certain fixed voltage? If so, I'll have some thinking to do on the gauge hookup. (Heavens! Thinking!)

Well, let's see. Details, details. I need some sort of preferably high-resolution color monitor, probably 5" or less in size so I can fit it up front. It should run off of 12 volts. I'd be really surprised if I can't pick one of these up at an RV shop, where they stock all sorts of appliances for 12 volt car electricity. Or, do I need to do this? Seems like I see monitors for sale all the time that just need 12 volts to run them. What do I buy? Assume an Atari 800, with its various video outputs. It'll be a color output, preferably with high resolution, so it looks good.

I have some software to write. There's no "need for speed" mostly here; sampling the instruments once a second is just fine for me. So, I'll probably just use an Atari BASIC cartridge, and look up how to autostart BASIC programs. (I dimly remember there being a way; if you remember, would you tell me?) I will also have to *store* this program somewhere. I don't really want an 810 disk drive bouncing around along with the computer, which I'm going to have to shockmount anyway, so I think I'm stuck going the cartridge route and pure assembly, or BASIC and a second cartridge, plus the "glue" to make BASIC "see" and run the second cartridge. I can't say I've ever heard of anyone doing that; does anyone know how?

If necessary, I can tweak the OS as it initializes the BASIC cartridge or pick up a Newell OS board and *really* tweak things; I *think* I could just have the program forced into BASIC as though it was being typed in, then have the cartridge type "RUN," provided I hooked into the right interrupts. That's kludgy, and just one way of many. But believe me, I'm much less worried about the software than the hardware. (However, *any* help on this would be greatly appreciated; it's been a long time. During development and debug, I probably will have to use a disk drive to autostart the system, and I can definitely remember there being a way to do *that* and run a BASIC program; I just can't remember what. An AUTORUN.SYS file, maybe? That seems to ring a bell. I remember the AUTORUN.SYS file that gave you a list of .EXE files on your disk and let you run them according to letter, but this is BASIC, not assembler.

If I must, I'll go to assembler, but gee, having all the math and such capabilities of BASIC make it a lot easier to use, if I can get a program to autostart. It seems to me that bulletin board operators must have solved this ages ago.

I plan on *multiple* versions of this software as I play with it, see what works, and so forth. That would be the disk-based version, of course. I'd like to stick with BASIC, but won't if I can't autolaunch on RESET, store in a cartridge, and generally not have to jump through hoops to autostart it.

Also, for things like measuring RPM or wheel speed, of course I expect to go to higher speed and optimized assembler. I can get an amazing amount done in graphics 2 or so on that 1.79 MHz 6502 in terms of sheer sampling and stuffing samples into memory, and the Atari is overflowing with helpful timers and things. But first things first ... oil pressure and water temperature.

Power

Then, I got the tough one. Power for the 8-bit. The Atari has a power supply that feeds it, from a 120 volt power line. It supplies +5 volts for the digital circuits, +12 volts, and probably -5 and -12 just for fun (some chips require a bare trickle of voltage at those levels to balance internally).

I'm not sure how to do this. There's amps to spare on the CAR end, that's for sure. I could put a 12 volt and 5 volt regulator on the car's +12 supply (maybe put some diodes in series with the 5V regulator so it doesn't "see" so much voltage to hammer down) and put the regulators on a heat sink the size of the trunk lid and try not to worry too much. (Well, it does have the advantage of being the simple and obvious solution). But I have a gut feeling there's a better way, and that someone out there, better versed in analog than I am, knows it ... and I'll lay odds that someone has hooked up an 8-bit, or a similar computer (this stuff is all the same) to a car or other battery-driven, remote environment. I'd even bet if I knew where, there's an article on it.

Gee, maybe just daisy-chain some diodes and rely on the 1.5 volt drop across each one?

As you can see, I'm lacking practical experience; hence, I'm asking for help.

(Heck, maybe I ought to just open up the car-lighter adapter for the Lynx and check out the 7805 5 volt regulator and capacitor in there. Nothing to learn there, I guess. (*grin*). Did you know, by the way, I've blown out four of those adapters without even trying hard? Methinks something is wrong ...)

So, if you feel kindly towards me for an article from the past or Spectre GCR or something, or are feeling just plain charitable, and you know your analog electronics or a relevant article, could you give me some advice?

1) What would you do about the power supply? I'm not at all fainthearted about opening up the Atari machine, and I know which end of a soldering iron to hold; I've replaced the power supply caps in

one unit, in fact. Fair enough? It may be an older Atari 800 (I need 4 ports!), but I'm afraid of the effect of vibration on the RAM board connectors; I may have to go with a 400. (Count on me doing software development on an 800, though; that keyboard would drive me crazy otherwise.) Hmmmm, maybe a 48K RAM board for the 400 ...

I *really* don't know what to do about generating negative voltages for the -5 and -12 rails. MAX232 chip? This is out of my league. Maybe I could buy a big Eveready Lantern battery and change it every time I change the oil ...

Also, for a temporary amount of time, I'll have to push a disk drive, until the final software is in ROM and in cartridge. Again, what to do? Buy an inverter and plug everything into that? (If the inverter doesn't burn out power supplies, that might be the easiest way!)

2) I'm particularly concerned about spikes and glitches in the power supply. I've been told overvoltages and sags are really legion while starting the car; I can see some of them with the voltmeter I have wired in. The car varies between 12 volts before a start (I don't know what is there during the actual cranking, which is pretty grueling), and 14-15 volts during normal cruising around, after the alternator has the battery all charged up.

As for sags, I have no problem putting nearly a FARAD of capacitance on the rails. If the sag goes on that long, let the system drop and restart.

I would assume some sort of voltage limiter is called for here. I do not know if a voltage regulator alone will do all I'm asking of it. I'd also like the machine to have its power shut down completely if there isn't enough voltage to run it (like during a car start), and to get a decent enough powerup that RESET works. I'll take care of it RESETting into the monitor program if you can get it to come up.

As much current as you need is available, straight off the battery (which, really, ought to act as a capacitor for slow-moving stuff, but not high speed glitches or spikes).

3) I'm planning on monitoring heat or pressure driven potentiometers with the Atari's 4 analog ports; as necessary, I'll source their voltage/current from the Atari (with a nice thick wire, too; all I need is wire resistance cutting down the range I can measure!) These are standard Mallory or whatever gauge sensors. They typically screw into the engine block, which is ground for the +12VDC electrical system. So the Atari is going to have to "talk" to some extent to the car; am I going to have power supply problems because of that? Do I need to isolate the Atari in some manner? (DC-DC converter, maybe?) Or what?

4) I'm planning on having 16 bits of I/O from the ports for various inputs and outputs. The MAX232 chip, or its successor that doesn't need the external caps, looks like a quick way to interface to the car, *unless* a spike will kill it. (Perhaps zener diode the spikes? I don't know how fast zeners are.) Would you recommend a better way ... resistor network I tap off halfway down or something, or transistor? The key word is "rugged." Inevitably, some child is going to spill a milkshake on all this...

5) I've been trying and trying to figure out a way to hook up an ammeter to measure the current going to and from the battery. It's a 10 gauge cable, and I've seen 30 amps go through it. It's DC, though, so a normal transformer won't make it, although I've been told of folks doing it different ways; for instance, constructing a low, but precise, resistance "shunt," and measuring the delta-voltage over that. (E=I/R; if I "see" 5 volts, and know the resistor is one ohm, then 5 amps are travelling across the shunt). Steve Ciarcia points out that an ordinary 1" length of paperclip is a good 1 ohm source, or I could hit the catalogs and buy a precision part. (Scares me, though; 30 amps is to be treated with respect. It gets thick cables HOT.) Honestly, I'm not wild about running 10 ga. cables into the passenger compartment; if they short out, things get spectacular fast, and I burned up a wire in front of my dad once. He never quite got over it. Any ideas on ammeters?

6) How should I shield the monitor from the EMI noise of the ignition coil? (And the power supply? A capacitor / choke?) I don't want a lot of fuzz on the TV, since it'll be small enough as is. I'm planning on bar displays and possibly graphics 2-style HUGE characters so I can read them at a glance; I'm thinking about having a "recorder" type system to monitor, say, how fast the oil pressure comes up and how fast the engine heats up. This would be a moving graphics 7 or 8 strip-chart.

Yes, I'm planning on calibrating with the original meter-get a meter reading, then read the Atari value, and build up data tables. I don't expect functions to work that well; while I may interpolate between data points, that's about it. It would be great if I could run the meter and the Atari at the same time somehow and just scribble down values while the engine warms up, or even better, "teach" the Atari-say, "This sort of voltage coming in means 200 degrees. Remember." A calibrator program isn't that hard to write, and BASIC was my first, and still most prolific, language.

7) What am I forgetting?!? I know there is a lot *I don't know.* If I'm making a dreadful mistake ("Hey, you can't measure through those resistances against the Atari's 5V supply if it's grounded!") then *please* let me know (soon) so I don't smoke another computer. I just hate doing that.

Conclusion

Well, there you have it, my summer project: The Car. You SST

owners know the car; it's all over the Introduction. I'd like the car to remain fairly stock, but to have 1990's style instruments. Can anyone help me with the last few details? Circuit diagrams scribbled on old napkins are just fine-Compaq Computers started that way, you know!-but seriously, any help at all would be very much appreciated.

Here's some addresses. You can always send to *Current Notes*, but then it costs *CN* to forward to me.

USA Mail, Send To:

Dave Small

Car Project (this allows us to separate it from Gadgets mail, which we get *gallons* of)

Gadgets by Small

40 W. Littleton Blvd, #210-211

Littleton, CO 80120

FAX: (303) 791-0253

The regular phone line is hopelessly busy. Don't bother trying.

Online:

GEnie: DAVESMALL

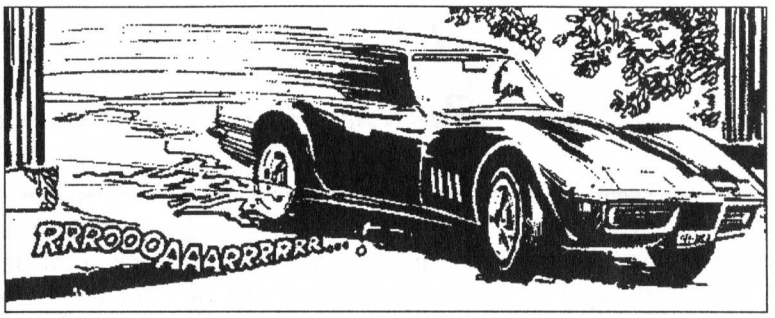
Compuserve: 76606,666 (expect a small delay)

Delphi: I have a sign on, but I don't check in. I forgot it.

Internet/Usenet:
dsmall·well.sf.ca.us

Internet/Usenet will work provided that The Well system has got its USENET connection back up. They recently went to hot new processor boards, had to recompile everything, and, well, it's like what I tried so hard to tell you in January-March ... "C" just is not all *that* portable. They're still bringing it up; in the meantime, I'm thinking of a UUNET connection, but the $300/yr fee brings me up short, I have to admit.

My direct USENET connection through Boulder was cut off, apparently along with all Boulder.EDU-downstream feeds, with no warning and for no stated reason. Thanks, guys; I hope my home college team (Colorado State, Fort Collins) whips the Boulder (Colorado University) team big time this year! Hence the Well connection.



I can certainly accept Degas diagrams, or VIDI-ST pictures, or probably Neochrome formats, and certainly anything Macintosh via the online services. I can fumble around with *Calamus* and *DynaCADD* but do not consider myself anything more than a buck private at using them; you may want to take that in mind and give directions a complete simpleton could follow. That'd be about right.

Oh, yes. Allow me to point out also that if you upload something into the Gadgets area on GEnie (type "gadgets" at any prompt) the uploads are *free*, vs. email, which is not. I may have to put your file into public access, though, if you go that way; GEnie is getting full of rules.

One exception ...

In all honesty, I simply do not own *Pagestream* (look ... I have *nothing* against it. It is simply that I have a wife with a 40 MHz IIFX, a top of the line LaserWriter NTX with its own 20 meg hard disk packed full of fonts and spooling space, every DTP program that is anything (*PageMaker, Quark X*Press, Illustrator, Freehand, MacPaint/SuperPaint/ThisPaint/ThatPaint, Pixel Paint*, a twin-page super high-res color monitor ...

... and I'm supposed to try to convince her that Gadgets needs an Atari desktop publishing program? Oh, Yeaaaahhhh! *You* try!)

Oh, Yes

Thank you to all the many people who wrote about Gary Hudson and their dreams of space. Me, too, people. As soon as Gary says it's okay, I'll tell you. It means a lot to me, too; I hope to have him come out to my place this month (May) for some serious talk on things ...

Finally ...

We are, as usual, drowned with mail at Gadgets, and FAXes. Funny thing about FAXes; people seem to assume that because they can *send* them to you more quickly, you will respond more quickly. The inch-high stack of FAXes awaiting my attention would evaporate that theory. (I also love the "where the heck is my reply? I've been waiting two hours" re-faxes.)

We've found that *Usually* the people who haven't read the manual, or who have a pirated version of Spectre 3.0 and thus no 3.0 manual, are the rudest about this. Perhaps it's just the rudeness required to rip off anyone's software showing through.

Please don't expect a reply Real Fast on the car project. I have Spectre this and MegaTalk that and SST stuff to do as well, and I want to weigh some ideas. But I need the recreation time, folks.

Thank you in advance to those who take their time to send me help; I may not be able to write back to all those who take time to write. If you don't get a reply, please accept my tired smile now as one of Thanks!

We'll see you next issue ... and yep, if/when the car gets done, we'll send in some photos. For unlike a house, this is a "natural" application for a computer.

And would I pick something other than an Atari?

The Canon BJ-10E

Laser-Quality Printing at a Reasonable Price

by Michael W. Reed

All impact-type printers suffer from something I call "ribbon fade." Unless one changes ribbons frequently, the last pages of a long document will be more grey than black. As a freelance writer, I have a need to impress editors and publishers, who demand crisp copy. So, although I already own a perfectly fine 24-pin dot matrix printer, I decided I needed something more.

Like most Atari ST users, my pockets aren't very deep, which mandated careful shopping. I was impressed to see street prices of some laser printers had dropped to around $650, but that was still a bit too steep for me. Ink jet printers had also come down, to around $500; better, but I kept looking. Finally, my research uncovered a great bargain—the Canon BJ-10e portable bubble jet printer, for under $400.

Bubble Jet Printers

Like lasers and ink jets, bubble jets produce consistently black copy right up to the moment their ink supplies run out. This prevents "ribbon fade." All these printer types deposit dots (or pixels) of ink or toner on the paper to form their images. But bubble jets deposit their ink in a rather unique manner.

An electrical pulse heats the ink within the printer's nozzles, creating bubbles within the ink. As the bubbles expand, they push drops of ink out of the nozzle and onto the paper. The ink remaining in the nozzle then cools, causing the bubbles to contract. This contraction creates a vacuum, sucking new ink into the nozzle. And so the process repeats itself.

In Canon bubble jet printers, the print head and ink supply are packaged as one replaceable unit. When the ink runs out, you buy a new print head. Canon claims this allows for simpler and cheaper manufacturing, a smaller and more durable printing mechanism, higher print quality through greater nozzle density, and quiet operation.

The Canon BJ-10e bears this out. It was designed to work primarily with IBM PC/AT-compatible laptop computers. It is, therefore, a small device, weighing only about 4 pounds, and thus portable. One standard parallel interface further simplifies matters. It comes equipped with an AC power adapter, but an optional NiCd battery pack is also available. Stacy users will especially appreciate this feature.

The list price for a Canon BJ-10e is $499; mine came from a mail order company for $289. In its basic configuration, the BJ-10e can efficiently handle only one sheet of paper at a time. This made the optional cut sheet feeder, at $69, essential. With shipping costs the total package came to $383—a bargain.

Getting the Printer to Work

Now comes the big question: Will the Canon BJ-10e work with Atari ST computers? Answer: Yes—mostly.

The BJ-10e comes with two emulation modes built in: 1) native mode, and 2) IBM Proprinter (X24E, etc) series mode. These are selectable via DIP switch; the factory setting is for IBM. If your software supports these modes, then you should have no problems. But be careful!

The BJ-10e manual is, for the most part, clearly written and well illustrated, but is ambiguous regarding the native emulation mode. It is unclear whether it emulates the earlier model BJ-130e or not. Allow me to illustrate.

The first bit of software I tested with the BJ-10e was *Calamus*, the DTP program from ISD Marketing. (By the way, for this test I used a stock Atari Mega ST2, no blitter. *Mouse Accelerator 3.3* and *Quick ST 1.75* were installed.) This program comes with a host of printer drivers, including one for the Canon BJ-130e. I flipped the appropriate DIP switch in the BJ-10e and printed out an old *Calamus* file.

The print out went quickly, but strangely. Only about 4/5's of the image printed, and portions of that were distorted. So, maybe the BJ-10e does not emulate the BJ-130e after all. I also tried the Canon LBP printer driver—zilch output.

I flipped the DIP switch back to IBM mode and tried the Okidata printer driver. Garbage. Next, I tried the OKI-IBM printer driver. The print out went slowly, very slowly, but completely. Nothing left out, nothing distorted. Great! However, there was an extreme excess of ink on the paper, which actually dripped and smeared. Back to the manual.

I flipped another DIP switch controlling graphics density and got a less messy output. Finally, I used the front panel programming buttons to select economy mode, which cut down the amount of ink used. I finally got a beautiful print out.

But now, yet another strange thing happened. After printing out the one-page test document, a second page of random garbage began printing out. *Calamus*

has always had a tendency to print out blank pages on my other printer, so something strange in the software is going on here. I've ordered an update to *Calamus (version 1.09N)*, and plan to talk to ISD Marketing about writing a special printer driver for the BJ-10e. Hopefully that will cure this problem. (See comments below for an update on *Calamus* performance. -JW)

Next, I tested the BJ-10e with *Word Writer ST* from Timeworks. Frankly, I had little hopes of this working properly, since *Calamus* didn't. But I was surprised. After some experimentation, I discovered that the printer driver labeled OKI:93I worked perfectly. But it was here that I discovered a shortcoming in the BJ-10e that I had not noticed when reading the manual.

Some Good Features and Some Disappointments

Like most printers, the BJ-10e has its own, onboard character set which it uses for print outs. It will support 11 variations (such as proportional, pica, and elite) of a Courier-style, serif typeface, but it does not do italics. A shame, I feel.

A feature I really like about the BJ-10e is that any one of these 11 variations can be set with the front panel buttons. If I want to print out a file with some special characteristic, say double-high, I merely press a button on the printer instead of figuring out and embedding special decimal codes. Nice, since I'm a writer, not a programmer.

Another nifty feature is a special slot on the bottom of the printer for feeding in envelopes, heavy paper, or transparency film. Be sure to flip the appropriate DIP switch.

The optional cut sheet feeder can handle about 30 pages at a time. Just flip the appropriate DIP switch, stand the printer on its back edge, and attach the feeder. This process is clearly illustrated in the feeder's manual, but is not simple. Be patient. The assembled product has a compact footprint, about 12 inches by 4 inches. It also resembles the new, inexpensive ink jet printers from Apple.

The BJ-10e is exceptionally quiet. Overall noise is rated at 45 dB(A). Most noise comes from the paper handling mechanism; printing itself is silent, since nothing but ink strikes the paper or platen. This is a great blessing for those who don't like their brains rattled by the clatter of daisy wheels or buzz of dot matrix printers.

The BJ-10e is rated at 83 characters per second in high quality, pica mode. Sounds reasonably fast, but this is deceptive. Paper handling is quite slow, reducing throughput drastically. The result is an average print speed of about 1 page per minute. Molasses in January may run faster.

Slow output is redeemed by high quality output. The BJ-10e's text mode strikes me as being as good as most laser printers. It is razor sharp and consistently black. However, in graphics mode the ink has a tendency to splash just a little. Special laser paper might help there.

The ink cartridge/nozzle print head is said to last for 700,000 characters. By my calculations, that should be about 350 double-spaced pages. Supposedly the cartridges cannot be refilled and must be replaced when empty. Hopefully some enterprising soul will find a way around that, as has been done for the HP Deskjet.

The Bottom Line

To summarize, the Canon BJ-10e is a marvel of modern technology--small, quiet, reliable, portable, and inexpensive. It seems well-suited for many home printing applications.

The BJ-10e does have some shortcomings, however, as might be expected from such a low-cost device. It is slow and lacks italics. It also may not be compatible with all Atari ST software. Check your software before buying this machine. But if your brand does support this printer, I whole-heartedly recommend it. Laser-quality printing at a reasonable price is finally available.

ISD Update

The good folks at ISD Marketing responded quickly to my pleas for assistance and straightened me out about how to use the BJ-10e properly with *Calamus*. First, one must switch on the #7 (alternate graphics mode) and #10 (BJ-130e emulation mode) DIP switches. Next, within *Calamus*, load the BJ130.CPD printer driver. Then, at print out time, select the following options: 360 x 360 resolution, letter size paper, and cut sheet paper handling.

Having got everything set up properly, I tried printing a fancy, one page document which included very thin text styles, lines, boxes, and shadow masks. On my 24-pin printer the effect was fairly impressive. On the BJ-10e the effect was stunning.

There were no jaggies whatsoever--all curves and diagonal elements printed out smoothly. The thin fonts miraculously lost weight and slimmed down to eye-catching beauty. The lines and boxes were sharp-edged. The shadow masks were no longer crude clumps of thick pixels, but rather, a fine gray mist.

After some anxious moments early on, the BJ-10e eventually exceeded my expectations. This is truly output which rivals laser printers.

Knightmare

A Game Full Of Fantasy & Magic

Review by Fred Percifal

By all appearances, the most popular ST game of 1991 in this country was Mindscape's *Captive*, a hardware-intensive science fiction role game created by Anthony Crowther. For 1992 Crowther has retooled the "Captive Game System" and produced *Knightmare*, a product that puts the player into the familiar dungeon-fantasy-magic environment.

Reworking a Classic

Knightmare is based on a British television show of the same name. Both the manual and the game itself are filled with pictures of two people, apparently the stars—Treguard, the Dungeon Master, and Pickle, the elf. It is assumed that the game player is familiar with the show. Luckily, the ignorance of American computer owners does not detract from the game play, which is similar not only to Captive, but Dungeon Master as well.

Most ST owners have played FTL's *Dungeon Master*, and *Knightmare* is modeled on the program that created the first-person role playing genre. The real-time view screen is there, as well as the eight hands for controlling weapons, the character status displays, and the movement icons with key equivalents. There is a separate screen for viewing and handling backpack objects. What changes there are from the FTL interface are all improvements. The game flow is identical to DM's, with a delicious mixture of opponents and puzzles. Mr. Crowther pays homage to DM with recreations of some of that game's constructs, including the corridor of doors requiring gold keys for their locks and an exact reproduction of the Fireball Room. Anyone who has enjoyed playing *Dungeon Master* will have just as much fun with *Knightmare*.

Choosing a Cast

As always, you start by creating four characters. There are six Professions in this game, three hacker types and three magic user types. Like *Dungeon Master*, you advance your characters by practicing with the tools of a given Profession. Unlike DM, there is no magic system. The game treats wands, staffs and crosses as magical tools holding useful powers. Characters who become skilled enough can utilize them rather than learning runes, the traditional media of role playing game (RPG) magic. Crosses are Priest tools, wands are Wizard tools, and staffs are Genie tools. Priest functions are strictly health-related; the Priest is really the medic. Wizards get weapon-type spells pretty early on, as well as a couple of utility spells. At the beginning the Genie's role is mostly defensive, although that changes as advancement occurs. The front-line fighting professions are Adventurer, Samurai, and Gladiator. Your characters start the game naked, and are grateful to find underwear and pen knives. Better weapons and clothing become available as a party progresses, and by the end, the crew is wearing plate armor while wielding chain saws and awesome magical devices.

Quests and Opponents

You begin the game in a forested compound, and ride a rail cart to the main forest. The forest contains a few basic objects and an unlimited supply of rabbits, your main source of food. If you find a shovel, you can also dig for apples—both in the forest and in the later Quests. To win the game you must complete four Quests, each one getting longer and more complex than the previous one. These Quests begin and end at the forest, which serves as your home base. At first your characters are so weak that killing a rabbit is a major undertaking. Soon, experience works its wonders and they can take on packs of vicious elves (which provide most of the opposition in the first Quest). There is more variety in opponents during the second Quest, and by the end of it your group is rather formidable and not to be trifled with—even by wizards and baby dragons. The final tests are against giant blue demons; your fighters will need all their skills to survive these encounters.

Combat

Again, this has a familiar feel. You trigger the hands of your characters to use the weapons they hold. Only the front line can use hand weapons, while the back line can throw missiles, shoot arrows, cast spells, or even serve tennis balls. Sound effects enhance the action. But the opponents in *Knightmare* are craftier than those we've seen before. They don't just keep circling until they've been beaten to death. They turn in random directions and can even sidestep. These traits make close combat against a quick monster a real challenge, even for a veteran player. Bats and snakes spray you with poison, wizards cast spells on you, ghosts swarm you, dragons toast you. This is in addi-

tion, of course, to the many creatures who merely try to beat or slice you up!

Puzzles

Combat is fun and exciting, but the puzzles give a game its real flavor. *Knightmare* has scores of them, and they do get very tough. One puzzle involving moving rollerwalls around in a room is so difficult that a switch was added to let you get the prize by taking a different route. Puzzle elements include the classic transporters, false walls, floor plates, pits (there's a variation on DM's Pit Room), and fireball launchers. New twists include water (and boats), rail cars, quicksand and swamp. The most original puzzles are made up of combinations of rotating blocks. Picture a floor block. The dimensions are what your party moves in one step. A switch, that you control, turns it 90 degrees clockwise with each throw. Sounds pretty simple, right? What makes it interesting is that the block grabs the four blocks touching its sides and takes them along as it turns. So if your party is looking down a corridor with one of these rotating blocks in the center and then throws the switch, they are now facing a wall, because the two side walls are now residing in the place of the old corridor openings and vice-versa. That's still straightforward, and so are the first few rotating block encounters. But then you discover adjacent rotating blocks! Groups you must turn in a precise sequence to pass doorways from one block to another to form passageways. These areas definitely cause cranial overheating and have quickly become infamous.

Final Tips

Although you select a profession for each of your characters, cross-training is vital for two reasons. Advancement is fast at the lower levels, so you can build stats much faster by going up one grade in six different Professions than you can by going up six grades in one. It's also very handy to have at least two characters who can perform the basic priest functions. If you have only one competent priest and that character gets poisoned, blinded, etc., you have a serious problem. Also, physical combat is required to raise stamina above a certain level. Casting spells just isn't aerobic. And, finally, the last three Quests cannot be exited until they're completed. If you're concerned about running out of food while in a Quest, you can throw food through the entrance transporters to create a private stockpile.

Knightmare comes on two double-sided protected disks, so it is not hard drive installable. The game will run on a 520, but 1 Meg gives you fewer disk accesses and more sound effects. The game delivers stereo and full palette on an STE, and runs with no problems on Mega STEs. The stereo sound effects alone make this game worth checking out for STE owners. The software detects a second floppy drive if available. Two drives virtually eliminate swaps. It saves games in a special format on separate save disks. Colors in the game are primarily earth tones, and it looks very dark if played on a dim Goldstar monitor. Don't worry—the interface includes an icon which brings up a color control panel, allowing brightening of the palette. The game does have problems on computers with 4 Megs of RAM. If your computer has 4 Megs of memory, you must hide the upper memory from the game by either booting with a reset-proof 2 Meg Ramdisk or running MAKE1MEG.TOS before starting *Knightmare*. The manual is a great improvement over the *Captive* manual, and does a good job explaining the game interface.

Knightmare is a Mindscape product. Advertised prices are in the $40-$50 range.

KNIGHTMARE'S MAGIC

(Users start with the first spell, but can access all six spells on each, eventually.)

Wand of Magic

Open	Can remotely operate button doors. Used in some puzzles.
Glow	Highlights objects which might otherwise be overlooked.
Dart	The first offensive spell. Fires a shot close to the floor.
Dispel	Your only weapon against ghosts.
Cloud	Throws a packet of deadly smog at an opponent.
Birds	Like Dart, but goes in high. Can be thrown through windows and portcullises.

Cross of Aid

Rem	Puts group into 'deep' sleep for rapid regeneration.
Fitness	Ups Stamina Stat
Restore	Ups Health Stat
Aid	Repairs wounds too serious to regenerate/ Restore.
Cure	for poison
See	Cures blindness

Staff of Mystic

Confuse	Works on opponent like a spinner.
Remove	Removes False Walls.
Shield	Affords some protection from attack damage.
Block	Affords some protection against magical attack.
Pow	Increases damage done by your swords.
Aim	Helps your combat accuracy.

The ST Book
A Replacement for the STacy?

by James Parker

Wait for ST Book?

I've been involved with Atari computers since 1984, starting with a 600XL and a 1010 Data Recorder. Since then I've owned an 800XL with 256K of RAM, a 130XE with 320K, Indus Drives, 1050 drives, XM301 modems, 1020 color plotter, P:R:Connection, a 256K MIO, and then to the ST line, starting with a 520ST with a color monitor, then a 520STFM, a 1040ST, and now a Mega STe with 4 megs of RAM.

I'm a professional musician, and travel quite a lot. I use C-Lab's *Notator* software to arrange and score songs, and needed a laptop to take on the road with me. I lose a lot of work not being able to arrange on the road, so I started looking into the laptop scene. *Notator* is only available for Atari systems, so I was limited to two choices: the STacy, or wait for the ST Book. I recently ordered a STacy portable to add to my lineup.

"Why not wait for the ST Book?" you may ask. Because the ST Book doesn't meet the needs of veteran ST users, either old or new ones.

The Battery Game

Let me explain why I think Atari has once again, shot itself in the foot. I read everything I could get my hands on about the two machines. I knew the STacy had no battery life, at least not any from Atari. But, third party developers had come up with 2-5 hour battery packs for the machine. The ST Book, on the other hand, was advertised to have at LEAST a 5 hour battery life, and optimistic estimates put it closer to 10 hours of use on a single pack. After the bashing Atari received from the STacy's 30-minute battery, it seems they sacrificed everything in order for the ST Book to have an enormously long battery life when 3-4 hours would have been more than sufficient for most people.

Still Waiting for ST Book

Although Atari was supposed to have the ST Book available by the end of the first quarter (that's the first quarter of *this* year), it's still not. Big surprise, huh? January's edition of *Atari Explorer* even went as far to say in the editor's note that "'91 was 'The Year of the ST Book!'" Excuse me? It's April, 1992 and we still don't have the ST Book. At first, the ST book was going to be available in 1, 2 or 4 megabyte models, but because of the "power saving techniques" employed, there would be no way to upgrade the memory once you purchased a machine. So now, Atari will only be making 4 megabyte models. This will undoubtedly drive the price of the ST Book up even more, possibly quite close to $2000.

No Internal Floppy for ST Book

The big kicker is that the ST Book will have no internal floppy drive. Takes up too much power, and we can't have that. It seems that IBM and Apple have no problem making notebooks with 1.44 meg floppies that last quite a while on batteries, but Atari had to have a 10 hour battery life. There is no standard floppy drive port on the ST Book either, so you can't just plug in one of your own standard external ST floppy drives. If you want a floppy, you'll have to buy Atari's external, battery operated 1.44 meg floppy. I hope that it will be available when the ST Book finally is. With no floppy drive, how do you get the files onto the ST Book's hard drive? Atari is supposed to include a special cable that connects to the parallel ports of the ST Book, and your other ST. You *do* have another ST, don't you? If not, than I guess you'll have to buy the external floppy, if and when Atari releases it. The cost for the system has definitely gone over $2,000. A person buying his first computer, and deciding that he wants a portable machine will most likely not bother with the Atari ST Book when he can buy an IBM notebook at a much cheaper price.

Other Needs

The lack of a floppy drive is not the only shortcoming of the ST Book. The nonstandard floppy/ACSI port on the ST Book means that until Atari comes out with a special cable, you won't be able to hook up external hard drives, or an Atari Laser printer. In Atari's defense, Atari has stated that "We'll *probably* include a cable that will allow you to connect ST devices like hard disks or laser printers directly."

The ST Book is not backlit, and the reason is, according to Atari, "The ST Book will be used in lighted conditions. All you need to see the screen is a small gooseneck light, which musicians, for example, have anyway. We're also talking to third party companies about doing an ST Book light." Now, wait a sec... If the ST Book is supposed to be used in lighted conditions, why talk to third party companies about making a light for it?? The back light just takes up too much darn power, so they cut it out.

There is no trackball to control the mouse pointer on the screen, but instead there is a new gizmo called a "Vector Pad." Now this neato thing doesn't move at all—you simply press on it in the direction you want to move the mouse. How hard you press tells it how fast to move the pointer. What if you are at home, or at a desk somewhere, and want to use a regular mouse? Too bad. No mouse port. This may not all be bad, as most people who have used the Vector Pad have liked it. Still, a choice would have been nice.

Missing the Target

Atari has aimed the ST Book at musicians, to fill the niche left by the no-longer produced STacy. Well, the MIDI ports are not the right size. They're miniature. The ST Book is so small that Atari couldn't fit standard MIDI ports on the thing. According to Atari, "you will be able to buy an adapter so you can use regular MIDI cables, and a third party will *probably* come up with MIDI cables you can plug right into the ST Book." Gee, that word *probably* sure does pop up a lot doesn't it? When will this adapter be ready? Who will make it? How much *more* will it cost on top of the machine and external floppy?

Let's say that you don't own an ST and you buy the ST Book, with the external HD floppy. A few months down the line you want to play some games, or use some programs that will only run on a color monitor. Well, just buy a color monitor and plug it right into ... oops. No monitor port on the ST Book. Takes up too much power. You are trapped in black and white, unless you buy another ST with a color monitor. Is this a sneaky ploy by Atari to sell more ST's? Plus, there are no joystick ports, so most games wouldn't work anyway.

Another kicker is that there is no cartridge port. Yes, that's right. No cartridge port. As I mentioned in the beginning, I use C-Lab's *Notator* to do most of my work. And guess what? There is a "dongle" that must be present where? You guessed it—the cartridge port—in order for *Notator* to work. But all is not lost. According to Atari, "the expansion port contains all the signals necessary to *create* a cartridge port. To make a cartridge adapter requires a PC board and two connectors, period. A third party *could* easily build adapters, or special cartridges." Just what any Atari user could easily do. Build his own cartridge port. Or wait to see if some third party company decides to build one. Another cost is added.

The standard ST keyboard has 94 keys, and the ST Book only has 84. There is a "Fuji" key, which allows access to the "keypad" modes in the normal keyboard. How well this works, or if it will access all keys may not seem that big of a deal to some people, but with me it's critical. Notator makes extensive use of keys on the numeric keypad to start, stop, record, advance the sequence and other important functions. Without them, using it could become impossible. Granted, this is only one program, but others could fall into the same category.

Just what ports does the ST Book have?

Expansion Port (so you can build a cartridge port)
Standard Parallel
Standard 9-pin serial
Mini-MIDI ports
Floppy/ASCI port
Small 10-pin connector next to the keyboard

The 10-pin connector, according to Atari, is so that "we *could* build a numeric keypad that could plug in here."

I think you can see why I chose the STacy over the ST Book. Here is a chart to help:

	STacy	STBook
Battery Pack (10hr)	NO	YES
Battery Pack (3 hr)	YES	NO
Available Now(Limited stock)	YES	NO
Memory upgradeable	YES	NO
Internal floppy	YES	NO
External floppy, or HD	YES	YES
DMA Port	YES	NO
Monitor Port	YES	NO
Standard MIDI Ports	YES	NO
Use a standard mouse?	YES	NO
Joystick Ports	YES	NO
Cartridge Port	YES	NO
Backlit Screen	YES	NO
Internal Hard Drive	YES	YES
Full keyboard	YES	NO
Serial Port	YES	YES
Parallel Port	YES	YES
Blitter Chip	YES	YES
TOS Version	1.4	2.06

Where does the ST Book outshine the STacy? In the battery life department, and in the size and weight. The ST Book is a good deal smaller and weighs less than half of a STacy. The ST Book also comes with TOS 2.06. but upgrades are in the works for older TOS users.

For someone buying his first ST, and wanting a portable, the only choice would be the STacy. If you want one, act now, as supplies are drying up fast.

But, for someone who wants a small, lightweight notebook ST and already owns an ST for the home, the ST Book may be what you are looking for. While IBM and Apple are producing notebooks that are just as small, with every feature you would ever want or need, Atari is expecting to sell the ST Book on its long battery life and MIDI ports that are too small. If it sells once it finally does reach the market remains to be seen. I hope for Atari's sake that it does.

6 ToadPlus Hard Drives

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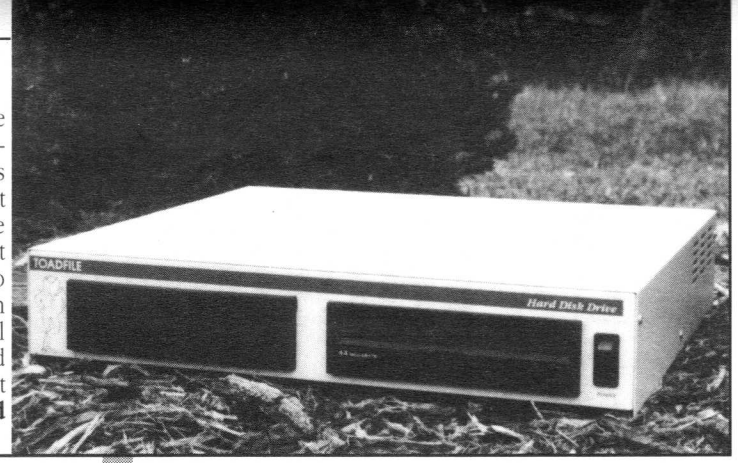

7 Summer Fun!

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- California Games
- Checkered Flag
- Chip's Challenge
- Crystal Mines II
- Demonsgate
- Dino Quest
- Dirty Larry
- Dracula
- Electrocop
- Eye of the Beholder
- Full Court Press
- Gates of Zendocon
- Gauntlet
- Geo Duel
- Hard Drivin'
- Heavyweight Contender
- Hockey
- Hydra
- Hyperdrome
- Ishido – The way of stones
- KLAX
- Krazy Ace Miniature Golf
- Kung Food
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- Scrapyard Dog
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- Strider II
- Super Asteroids/Missile Command
- Superskweek
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☛ There's still time to take advantage of our *MegaDeals*. With the purchase of any Mega STE, in any memory or hard disk configuration, you can get a color or monochrome monitor at a substantial discount. You'll get a complete Mega STE system, with hard drive and monitor for the price you probably paid for your 1040ST system! Consider it. To upgrade your existing ST, you might have to spend as much as $1500 to get comparable RAM upgrades, accelerators, new TOS versions, hard drives, and a detachable keyboard. For well under that price, you can get a brand new Mega STE, which includes all of those upgrades, not to mention the VME card slot (for expanded video) and Appletalk compatible network port. And it includes a monitor! Why don't you give your old ST to a friend or family member, or keep it as a spare. Remember, an upgraded ST is never as reliable as a new machine. Isn't it about time you stopped cramming things under the hood and thought about buying a new car? Now you can – *without feeling guilty!*

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  With Any Mega STE ***$309***
- **SC1435, SM147,** and Switch $579

3 32MB FASTRAM

☛ Are you frustrated by the high prices, inflexibility, and low availability of Atari's TT RAM boards? Well now you don't have anything to complain about! Our new ***Toad-TT 32MB SIMM Board*** expands the bounds of the TT030 from 26 to 42MB! With eight one-megabyte SIMMS, you get eight megs of FastRam. With eight four-megabyte SIMMS, you get thirty-two megs of FastRam. And because you can upgrade in four-SIMM increments, you can start at four and stop at eight, sixteen, twenty and finally thirty-two megs! Buy this excellent board configured with our excellent RAM, or populate it yourself!

- **Toad-TT 32MB SIMM Board (Empty) $399!**
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- ***Choose from Many User-Editable Icons for Devices and Files***
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- ***NEWDESK Icon Editor CPX! (TOS 2.06 & Up) $27!***

5 Productivity and Utility Software

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- **PageStream** Plus Pack $59
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- **Calamus** Font Editor $59
- **Calamus** Guide to DTP $31
- **Calamus** Font Guide $24
- **CalAssistant** (Helper) $29
- **Timeworks** Publisher $59
- **Timeworks** Publisher 2 $139
- **UltraScript** ST $109
- **CompoScript** (NEW!) $329
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UTILITIES

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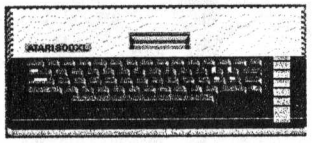
8 Bit Tidbits



by Rick Reaser

8 Bit Magazine Update, XDM121 Printer, Atari Explorer Online, TextPRO+ Version 5

I have a lot of material this month so I'll jump right into it. Our prolific writer, Charles Cole, appears once again in this issue, performing surgery on his SpartaDOS X cartridge. A new face, Gordon Cooper from Victoria, British Columbia joins us for the first time with a little humor from north of the border. Finally, Steve Leser, a regular *Atari Interface Magazine* contributor, crosses into CN territory this issue. Now, on with the news...

Cursor Confusion

On top of omitting the last 10 lines of Ed Hall's April CN Custom Cursor BASIC program listing, we may have caused some head scratching with several of the REM statements we added to clarify things. Lines 325, 335 and 345 refer to changes made to the original programs found in *Antic*. I could say that we do these things to keep our readers on their toes, but that would probably be stretching the truth.

On-Line Candidates

It seems that several of this year's presidential candidates are taking advantage of a media familiar to many of us Atari 8-bitters--computers and on-line computing services. The voter forum and related Spin Doctor bulletin board on CompuServe are flooded with hundreds of computer messages begging for a piece of the H. Ross Perot action. As many of you know, Mr. Perot runs a large computer-related company, EDS. Here is a sampling from CompuServe.

> Oh, wow, one of us," said one message, alluding to the possibility of a president who spent his life playing with computers.
>
> I'll bet he'd be online every day of his presidency.

Not to be outdone, presidential hopeful Jerry Brown held an on-line round table on GEnie recently to get in touch with the computer masses. It appears that even politicians are starting to reckon with the power of personal computers and their owners. That's why I'm serious about all 8-bitters getting a modem. Who knows, you and I may be casting our ballots with our trusty Atari Classic computers one of these days.

8-Bit Magazine Campaign Update

The mail-in campaign to poll support for an independent Atari 8-bit magazine, to be called *Atari Classics*, is officially over and a complete success. As of May 2, a total of 556 written commitments have been secured, and late returns are still wandering in. It's still not too late to mail in your postcards.

Statistics from the campaign follow. 1,512 campaign information packets were mailed (1,100 in the U.S., 412 internationally) to individuals and user groups. This involved a total of about 12,000 individual xerox copies, 2,000 envelopes, 4,000 printed labels, and an estimated total expenditure of $1,650. Internationally, returns were received from Australia, Canada, Czechoslovakia, France, Germany, Great Britain, Israel, Italy, Norway, The Netherlands, New Zealand, Romania, and Sweden. A complete report can be found on GEnie in file #5854 or see message 18446 on CompuServe.

What's next? Jeff McWilliams and Ben Poehland are presently engaged in forging the sinews of *Atari Classics* and presenting the results to Unicorn Publications. The subject content of *Atari Classics* will be taken from comments on the return cards and from discussions in public forums on the various telecommunications networks. All interested 8-bitters are encouraged to offer their opinions/suggestions. Communicate your views to the Info-Atari8 newsgroup on the Internet or the 8-bit Forum on Compuserve. You may also contact:

Jeff McWilliams
2001 G. Woodmar Drive
Houghton, MI 49931-1017.
Internet: jjmcwill@mtus5.mtu.edu
or Ben Poehland on GEnie: B.POEHLAND.

XDM121 Printer

For the past few months I have been reading San Jose Computer's two page ad spread in *AtariUser*. They have been consistently advertising Atari's XDM121 printer for $49.00. I've never been big on Atari printers myself, having forked out a fortune for my Daisywriter 2000, a truly fine printer. (My dad actually has six working Daisywriter 2000's, but that's another story.)

Last month, one of my user group members, Lee Barnes, brought his new XDM121 to the 8-bit SIG meeting. I was very impressed. First, it is a true daisy wheel printer. Second, it is very heavy and appears to be well built. Third, it is programmable. Fourth, it doesn't need a parallel interface. Fifth, it is a steal for $49.00. It is a bigger steal than those $19.95 SX212 modems from DAMARK.

The original price on the box was $249.00 and Lee was positive they had sent the wrong printer. It was just too good to be $49.00. If you are looking for another printer to hook up to your second or third 8-bit system, this may be the one for you. It could be the perfect printer to do letters or envelopes or your children's school projects. For further information please contact:

San Jose Computer
1278 Alma Court
San Jose, CA 95112
(408)995-5080 Voice, (408)995-5083 FAX.

1992 BELLCOM Catalog

After reading their advertisement, right here in *CN*, I ordered the BELLCOM Catalog. It is quite nice. Every time I get a new catalog, I find more things that I have never heard of. Two nice things I noticed in the BELLCOM catalog are the BELLCOM info disk, which you get with an order, and the "revision section." The BELLCOM info disk is chock full of useful information like user group info, mail-order sources, repair part info, etc. The revision section identifies updates to previous BELLCOM offerings and identifies previously sold programs that have had problems or bugs. Updates and fixes are free. Bravo!!

BELLCOM is located in Canada and run by Don Bell. Canada has a pretty strong Atari Classic contingent. You'll notice that several *CN* authors are from that neck of the woods. As a result of this, I've picked up a few tips that I want to pass along. First, mailing a letter to Canada from the United States is 50 cents. Second, you can call Canada by just dialing the area code and number. It is just like a regular toll call. For a free BELLCOM catalog and further information, please contact:

BELLCOM
P.O. Box 1043
Peterborough, Ont. Canada K9J 7A5
(705) 743-1423.

New on CompuServe

I've been spending more and more time on CompuServe lately. I haven't gotten everything figured out yet, but I am getting there. I sent my first couple of E-mails from CompuServe to the Internet successfully. If you haven't tried this, it is quite handy. You send the message like you would any other, except you preface it with INTERNET› followed by the standard Internet address. This is neat stuff.

Speaking of neat stuff. Check out LACE3.DCM in the Atari8 Games library. It is awesome. This file has three board games, *Othello, Catch88,* and *Knight* from the United Kingdom. The title screen is almost worth the download. The really neat thing to me was that these games allow you to use different input devices, namely, a joystick, mouse or trackball. I have an ST mouse that I bought when I got *Diamond GOS.* The mouse action is superb on these games. It also gives me something else to use my mouse with.

New on GEnie

Several new and interesting files have appeared on GEnie this past month. Files 5791, 5805 and 5817 contain interesting Chemistry programs that test your knowledge of the periodic table among other things. File 5780 is a waterskiing game. File 5852 contains a program that allows you to print preview Daisy Dot III files that have been printed to disk. Finally, Oscar Fowler has uploaded an IBM PC/compatible program in file 5840 which allows IBM PC/compatibles to directly read Atari 8-bit disks formatted in SpartaDOS double density. This program is also available on CompuServe.

Internet

I have been informed that I have been shouting INTERNET instead of talking about the Internet. I will have more next month after digesting more Info-Atari8 Digests and other recently received information from Michael Current. I'm still looking for someone to write an Internet article.

Atari Explorer Online

On April 24, 1992, Atari Explorer announced its new on-line magazine, Atari Explorer Online (AEO). The first issue of the biweekly Explorer Online appeared on May 1, 1992.

In the AEO press release, publisher John Jainschigg said, "The goal of Explorer Online will be to serve the needs of all Atari users: Portfolio, Lynx, ST/TT, and 8-bit. We want to make Explorer Online a solid resource for the whole Atari community." The press release went on to state that current plans call for Ron Kovacs' firm, Rovac Industries, to continue publishing its popular Z*Net PC, and Z*Magazine publications, but the ST Z*Net will be merged with AEO.

Of course, this is confusing to an 8-bitter, because Z*Magazine is the Rovac flagship for Atari Classic computers. Mr. Jainshigg's statement about 8-bit support seemed to contradict the continued existence of Z*Mag. So I called Ron Kovacs to clarify things, at least in own mind.

The bottom line is that AEO will have very little 8-bit coverage. In fact, I didn't bother to try and download the first issue from GEnie, since it was in LHARC format, something that my computer probably doesn't speak. (BTW, I did get a letter from Howard Stebbins asking if there was an UNLZH program for Atari 8-bits. I told him there wasn't. Please correct me if I am wrong out there.) Ron Kovacs elected not to throw the Z*Mag staff into the AEO pot, because that would be too many people on a single project. Z-Magazine is fairly self-sufficient and

will continue to produce its 8-bit coverage on the "normal" :-) schedule.

TextPRO+ Version 5

Ronnie Riche is producing the final version of his outstanding public domain word processing program, *TextPRO+* (TP). *TP 5* is a modified version of 4.56 with conditional macro branching and a menu capability. The major new feature is the ability to write add-in machine language modules that load just like macros and can access TP routines to do just about anything that you want. *TP 5* provides 2K of space for source compilation of major mods and enhancements. All that is required is a *MAC-65* assembler and the *TP 5* source equate listing. In addition, the initial setup code segment can be used to load extension type functions similar to extensions provided in earlier versions. The result is a program with an easy path to expansion and improvement.

In all, there will be three versions of the final program as was the case for *TP 4.5*. There will be a lowmem, himem as well as an "X" version that allows bank switching for 130XEs and Rambo 256ed 800XLs.

Ronnie will be distributing *TP 5* like this. Registered users will receive a Beta version with an appendix for the new features by the end of June. (There have some delays due to Ronnie's finicky disk drives.) In August, Ronnie will distribute the final version with a revised manual that pulls the appendix information into the main manual to registered users. At that time, he will release the source code into the public domain and registered users are free to post or pass the program out. (The same goes for the Beta version.)

If you want to register your version, send $35.00 to Ronnie. Although he is not soliciting them, other shareware contributions for his efforts would probably be appreciated. One of the benefits that registered users will receive is free consulting from Ronnie if they have questions or need advice about making machine language add-in modules. Registered users will receive *TP 5* for no further fees. If you are registered and do not get the Beta version by the end of the June, drop Ronnie a line—something's wrong.

Here are few technical notes about the machine language module add-in feature. The macro buffer in *TP* is fixed in memory. Machine language routines are compiled to the start of the macro buffer and are called by a key sequence that verifies the presence of the routine and TP version compatibility. The macro is then called and executes. Since you can call TP routines and make any system calls you want using TP built-in functions (XIO, SCREEN, BUFFER, BANK etc.), you can write an entire print routine and call it instead of the TP routine. Actually, you could use a call to the TP load memory routine and overlay the entire TP print routine in memory. The only limitation is that the add-in machine language module must be compiled with the correct equate list. This is why TP version checking is done.

Since TP searches the entire macro buffer for a called keystroke, the macro buffer can also contain regular keyboard macros which are appended to the end of the machine language module. In this way, a macro can be used to call the add-in module. The only conflict would be if an add-in machine language module contained the key pressed followed by the inverse = sign—a scant possibility. This would simply scroll some machine language garbage into the editor.

Once the source code for *TP version 5* is published, there are bound to be a wide variety of enhancements as well as machine language module add-ins created. Here are a few of the ideas that are floating around on GEnie (Category 5, Topic 33).

- A machine language module could be used to open the XEP80 to do a print preview in 80 column XEP80 mode.
- A machine language module could be used to access a database. It should be possible to open a file from a macro and INPUT data to provide mail merge capability for people who don't have an expanded system.
- It might be possible to allow a graphics file to be printed as part of a document.
- A macro could be developed to automatically read the RTIME8 and place the date into a file.
- A machine language module could be written to display graphics screens from a macro as part of a file.

With all the modifications that could result from the availability of the source code, someone will need to maintain the "official" version of the programs. That individual will be Chuck Steinman of DataQue. You can contact Ronnie (or send your registration/contribution) as follows:

Ronnie Riche
1700 Ayock Street
Arabi, LA 70032
GEnie: R.RICHE

DataQue Products

Some of you may recall reading or hearing about a very interesting article in the November *Atari Interface Magazine* by Chuck Steinman of DataQue. Chuck proposed developing some 8-bit based products, the 1600XLE and the 130XEC. Those of you who missed this article can download file #5393 from GEnie to read about these ideas. Anyway, there wasn't enough interest or feedback for Chuck to proceed with implementation at this time.

Transkey is DataQue's most popular product. The Transkey modification allows you to use a standard IBM keyboard with your 8-bit. That's quite a temptation at times, given the steady degradation in keyboard feel from the vanilla 800 to the 130XE.

Some of you may also remember that Chuck was involved with a project to create a Midi-Maze program for the Atari 8-bit on GEnie. That project is continuing under the skillful leadership of Jeff Potter. More on this next month.

Many of you have probably noticed that Chuck is now also an 8-bit SysOp on GEnie, along with Darlah Potechin and Craig Thom. GEnie file #5393 also contains Chuck's latest offerings. For further information, please contact:

DataQue Software
P.O. Box 134
Ontario, OH 44862
GEnie: DataQue.1 (Daily)
CompuServe: 71777,3223 (Weekly)
DELPHI: DataQue (Monthly)

That's it for this month. Write, call or E-mail your requests, questions or complaints to:

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4625 Whimsical Drive
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H: (719) 380–8082, W: (719) 554–5905
GEnie: R.REASERJR1
CompuServe: 72130,2073

◄ Error Messages ►

by Gordon F. Hooper

All you 8-bit owners out there will be thrilled to learn that I have written a new error code list to add to your Atari manual. This is basically a translation of the Error Messages found in the back of your manual that you refer to when you or the computer make a mistake. These are the numbers displayed on-screen such as "Error 137," which, when you look it up, is "Truncated Record." This error typically occurs when the record being read is larger than the maximum record size specified in the call to CIO. (BASIC's maximum record size is 119 bytes.) Huh? With my new list you will now be able to understand at least some of the computer's intractable mysteries.

◄►◄►◄►◄►◄►◄►◄►◄►

Error 2 - *Insufficient Memory*
You are too ignorant to ever understand the intricacies of a computer.

Error 3 - *Value error*
You fail to display the social principles or standards necessary to be considered a functioning member of the human race.

Error 4 - *Too Many Variables*
No wonder you can't organize your life.

Error 5 - *String Length Error*
The length of twine you cut is too short to use as a substitute for your shoelace.

Error 6 - *Out of Data*
This is the nineties. You're still living in the sixties. (Peace and love, brothers and sisters.)

Error 12 - *Line Not Found*
Just for a change, the computer is acting stupid, not you.

Error 20 - *Device Number Error*
First you must learn how to count before numbering your devices.

Error 130 - *Nonexistent Device*
It is necessary for you to remember that you are only dreaming of getting a printer in the future. It isn't there yet, Bozo.

Error 138 - *Device Time-out*
Your printer needs to interface with the coach.

Error 141 - *Cursor Out of Range*
If the cursor is off the screen, how the heck am I expected to find it?

Error 142 - *Serial Bus Data Frame Overrun*
I haven't quite figured this one out yet, but I suspect it has something to do with people lying flat (*very* flat) on the pavement with lots of blood around.

Error 144 - *Device Done Error*
Another one of the few that you can blame on the computer.

Error 167 - *File Locked*
This keeps all you nosy people out.

Error 171 - *Invalid POINT*
You won't win many debates using these.

Error 199 - *SU Error*
SU stands for Stupid User. This is the source of 99.5% of computer errors.

◄►◄►◄►◄►◄►◄►◄►◄►

It is a proven fact that when users complain of not being able to understand a program, 9 times out of 10 they have not even bothered to read the docs. You'll have to trust me on this one, but the one reason documentation is written is to explain the program. The manufacturer didn't pay someone big bucks to do all that writing for no reason.

I am one of the worst offenders in this regard. It brings back frustrating memories of assembling various items. I have the habit of not reading the instructions until I have done something which is un-doable. Why I don't read them in the first place and avoid the problem is one of life's unexplained mysteries.

It is simply an unstated fact of computer life that computer users will not read docs until after they have sat and screamed obscenities at the machine for periods of up to half-an-hour. After they have that out of their systems, they will sit down and look up their problems in the manuals' list of contents and turn to the page indicated to find out what they're doing wrong. We computer users like to think we're more intelligent than the general population so you'd think we would have enough brains to learn how to do something before attempting it with no idea of how or what it's supposed to do. But then you'd also think we'd be smart enough to play a game without becoming addicted to it, and we've all played games until the wee hours of the morning at one time or another, haven't we?

Speaking of lack of grey matter, why is it that it takes a major disaster such as having typed for 8 hours straight and forgetting to write it to disk or make a back-up before the new user remembers that the number one rule for computing is *always make a back-up.* Remember this the next time you wish to flush your computer down the toilet.

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Solving the SpartaDOS X Incompatibility Hassle

Adding On/Off Toggle Switches to the SpartaDOS X Cartridge

by Charles A. Cole

One of the few shortcomings of the SpartaDOS X (SDX) cartridge from ICD, Incorporated, of Rockford, Illinois, is the necessity to remove the cartridge to run commercial AUTORUN programs such as *AtariWriter Plus, Data Perfect, Synfile+*, etc. I suggested (actually hinted) that ICD consider the addition of an on/off toggle switch to the cartridge if they could not solve this problem through a ROM revision.

Well, it appeared as if any chance of ICD taking my humble advice was thoroughly dashed with their announcement in June 1991 that they were discontinuing Atari 8-bit support. So, with nowhere else to turn, I decided to try the modification myself and see if it would really work.

Getting a Backup

Fortunately, when ICD designed the SDX cartridge, they made it very easy to open up the case for the simple reason that they were offering do-it-yourself upgrade ROM chips for it. I purchased an SDX cartridge when it was first released and had already upgraded from their initial version to 4.19. When ICD announced their half price sale, I fired off a quick order for a second SDX (4.2) to have as a spare if anything went wrong with my first one. I have gotten so used to using it now that I would really be lost without it, and didn't want to risk being caught dead in the water if my first one suddenly decided to quit on me.

On/Off Instead of In/Out

So with a spare to hack on, I decided to take the big leap and see what would happen if an on/off toggle switch was wired into the SDX so it could be turned on and off instead of having to unplug it all the time. Another prime motivating factor for this gamble was that I had already worn out one of ICD's 130XE MIO adapter boards by all of this plugging in and unplugging of the cartridge. I didn't know what I would do if the second one gave out on me and they were no longer available from ICD.

An Easy Project

The cartridge modification turned out to be an easy project, although a little more complicated than I had originally thought it would be. I initially thought that cutting only the +5 volt power supply circuit trace would suffice, but discovered that the ground trace must also be cut. No known on/off toggle switch of the Double Pole variety is small enough to fit inside the SDX case, so I wound up using two Single Pole switches.

But You're On Your Own

As with all articles of this type, I must provide the usual disclaimers before I and CN wind up being sued by someone who cuts the wrong circuit board trace or overheats and destroys a microchip—so here goes:

This project should be undertaken only by those who are experienced in printed circuit board soldering and modification. Neither the author nor *Current Notes* will be liable for any damage caused by an improper modification or improper soldering techniques. So there!

Not for 800s

This modification will *not* work on a SDX cartridge that is to be used in an Atari 800 computer because the toggle switches' handles will not allow the cartridge to be plugged in. Also, you should insure that the switches will be within reach when the cartridge is plugged in before you commence with any drilling of holes in the cartridge case. For those who are using the SDX cartridge with an 800XL or 130XE, be advised that a modified cartridge may not plug in quite as far as an unmodified one since a wire, which must be soldered to the circuit board, may prevent it from being fully inserted. In my particular case, I am using the ICD MIO and its attendant 130XE adapter board. In this configuration, the SDX cartridge plugs in on the adapter, and the switch and wire do not get in the way. I am certain that the cartridge still does plug in plenty far enough to function properly in an 800XL or 130XE, however.

Parts Needed

The parts you will need to round up before commencing with this modification are really minimal. First, run, don't walk, to your nearest Radio Shack or other electronics parts store and purchase two Ultra Miniature Single Pole Single Throw (SPST) On/Off Toggle Switches. One Double Pole Single Throw (DPST) or Double Pole Double Throw (DPDT) switch would be ideal for this project if they were small enough; however, empty space within the SDX shell is at a premium, so the use of two separate switches is easier to accomplish. Switches that are small enough are the Radio Shack number 275-624 and the GC Electronics 35-000.

Other supplies you will need are two short lengths (6 inches or less) of stranded wire, a 1/4 inch drill bit and drill, a small wattage soldering iron, solder, and a small amount of electrical tape. Simple hand tools such as a narrow bladed screwdriver, utility or X-acto

knife, and needle-nosed pliers are also required. For the wire, I used one of the strands off of a piece of 50-conductor ribbon cable. Ribbon cable wire is 28 gauge, which is plenty big for the low voltage involved.

Step 1: Open the Cartridge

Your first task is to very carefully pry open the SpartaDOS X cartridge case. Use a small screwdriver inserted into the ends of the cartridge to pry it open, switching from end to end and side to side periodically until the two halves are separated. ICD did not glue the shell together—it is held together by four small plastic posts.

When you have it opened up, you will see that the circuit board is attached to the front part of the shell by two of the plastic posts. OK, now look at the narrow end of the circuit board where it plugs into your computer. On the side of the circuit board that has the microchips and other components mounted, there are 15 electrical contacts. Although not marked, these are numbered as 1 through 15, counting from left to right if you have all of the lettering on the board right side up and the contacts facing yourself. My cartridges both had the number "J1" painted above the 4th contact from the left.

If you follow the electrical traces from these contacts, you will notice that only the first contact on the left actually goes very far—contacts 2 through 15 all terminate at small holes in the circuit board. These holes pass through the board to traces on the bottom, and are coated with metal so the electrical signals can pass through them. Contact number 13, the third one in from the right edge of the circuit board, is the +5 volt electrical supply which powers the cartridge.

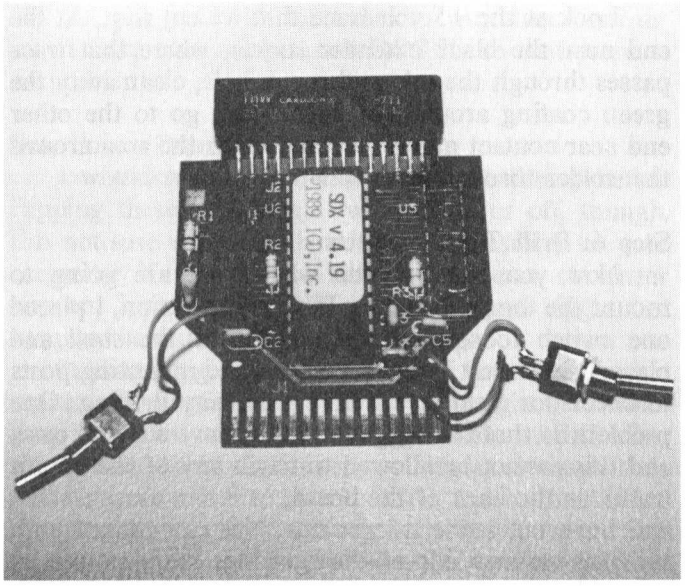
Step 2: Remove the Circuit Board

Work the circuit board loose from the two plastic mounting posts, being very careful that you do not break them off. The trace from contact number 13 on the back of the circuit board is wider than any others, and runs the entire length of the board. There should be one solder connection along this trace where a capacitor is soldered in (the number "C4" is printed above this capacitor on the component side of the board). The wide trace then passes through the board again at the other end near the black extender socket.

Step 3: Cut Power Trace

This is the first trace that must be cut so the +5 volt power supply can be routed through one of the on/off toggle switches before it reaches the capacitor, so the cut must be made between the solder-through hole from contact number 13 and the capacitor.

With an X-acto or utility knife, carefully cut a section out of this circuit trace about half-way between the capacitor and the solder-through hole. Be careful that you do not cut any of the adjacent traces, and in-



sure that you have definitely cut all the way through the +5 volt trace. Inspection with a magnifying glass or checking with an Ohmeter might be in order at this point.

While you have the circuit board turned upside down, make sure the narrow end is facing you, and look at the second contact in from the right edge. This is contact "B" in electronic parlance, and also has a wide circuit trace running to components on the front of the board. This is the ground trace for the cartridge.

Step 4: Cut Ground Trace

This trace must also be cut somewhere convenient along its length before it reaches the first pin of the EPROM socket so its electrical signals can be routed through the other toggle switch. The best location to cut is near the EPROM socket where that trace is not too close to adjacent traces. Don't cut it at the end near contact B, because a wire must be soldered along this trace and should not interfere with plugging the cartridge in.

Step 5: Clean Coating

While we have the circuit board turned upside down, let's go ahead and prepare the areas where we are going to be soldering our wires. The circuit traces are covered with a green coating which will prevent solder from sticking, so you must clean this coating off in four locations.

First, look at the last trace you just cut. Halfway between that first EPROM socket pin and the end of the trace is a small solder-through hole. With your narrow-bladed screwdriver or a similiar tool, scrape the coating off of the board around this solder-through hole until the metal is shiny silver. Similarly, scrape a section of the trace between the cut and contact B.

Look at the +5 volt trace that we cut first. At the end near the black extender socket, where that trace passes through the solder-through hole, clean away the green coating around the hole. Now, go to the other end near contact number 13 and clean the area around that solder-through hole.

Step 6: Drill Toggle Switch Holes

Now you must decide where you are going to mount the toggle switches. In my installation, I placed one switch loosely in the bottom of the shell and placed the circuit board back over the mounting posts to check for clearance before I did any drilling. One problem is that the toggle switches have a metal case, and this cannot be allowed to touch any of the circuit traces on the back of the board, or it can cause a short and burn out some microchips. You can mount both switches on one side of the cartridge case, or one on each side.

I finally settled on locations on either side of the case as close to the bottom of the cartridge as I could get. This is also the end where the circuit board is narrower, so there was less risk of a short between the switches and the board.

There are microchips, mounted near both edges of the circuit board, that can easily short out on the switches if they are mounted higher up, so you may need to bend their pins over so they will clear the switches, and then cover them with electrical tape if you are going to mount the switches in the upper part of the cartridge case. If you do this, cover the circuit board with a narrow strip of electrical tape near the pins before you bend them over, or they can short on adjacent circuit traces.

After carefully judging where you want to drill the mounting holes for the switches, drill 1/4 inch holes as near the center of the cartridge case as you can get, front to back. Check the toggle switches for clearance without their mounting hardware in place. Place the circuit board back over its mounting posts and check for clearance between it and the switches. If necessary, you can elongate the holes so the switches will lay as flat as possible against the front of the cartridge and away from the circuit board.

If you mount both switches on the right side of the shell as it is laying flat, they will be on the left side when the cartridge is reassembled because you are working on the front half of the shell. If you want the switches to be on the right side, you will need to drill on the other side of the shell and run one set of wires across the cartridge case under the circuit board.

I mounted one switch on each side of the cartridge because there is more room to do it this way, and the switches are also on the sides of the cartridge where the traces are that have been cut.

Step 7: Solder Wires to Board

Place the circuit board in a convenient location with the contacts facing you and the microchips on top. Strip a small section of the insulation off of one of your wires, twist the strands together, and push it through the solder-through hole near contact 13. Turn the circuit board over and solder this wire to the board from the bottom. Double, triple, and quadruple check to insure that you have the wire through the proper hole before soldering it in place.

Now strip the other end of this wire, and push it through the hole at the other end of this trace near the black expansion socket. On the component side of the board, this hole is along a wide "L" shaped trace running from the EPROM's first pin to the black socket. Turn the board over, and solder this connection from the bottom (it should be the hole at the end of the +5 volt trace from which you previously cleaned the green coating). Another option is to solder it to the right leg of capacitor "C4."

Strip one end of your other wire and push it through the solder-through hole near the middle of the ground trace. From the top of the circuit board, this hole is close to the left side of the EPROM just above the painted number "C2." Turn the board over and solder this connection. This, also, should be at one of the areas that was scraped clean earlier.

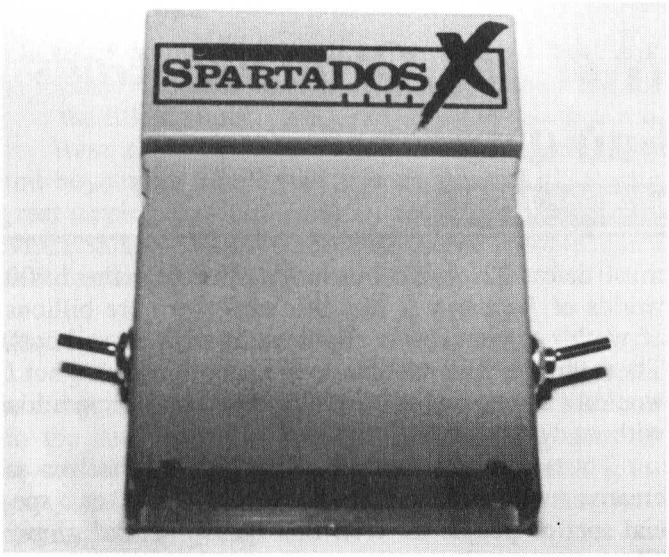
Strip the other end of this wire, leave the circuit board turned upside down, and solder it to the cleaned section of the ground trace between contact B and the cut you made in this trace. Make sure this wire is pointing away from the contact at the end of the board so it does not interfere with plugging the cartridge in, and also make sure that no bare wire is touching the end pin on the EPROM socket.

Step 8: Attach Wires to Switches

Bear with me, folks! The worst is over! The only thing left to do now is cut these wires in their middles to the a length suitable for reaching your on/off switches, strip these ends, and solder one set of them to each of the toggle switch's contacts. Leave the wires long enough so they can reach the toggle switch when the circuit board is placed back over its mounting posts. Extra wire can always be pushed under the circuit board out of the way.

Step 9: Mount Switches

We're almost done, now. The only thing left to do is mount your switches to the cartridge case with the lock washer and one of the two nuts provided, making sure that each one is laying as flat against the cartridge shell as possible and the ON position is toward the top of the shell. Place a small patch of electrical tape over the metal casing of each toggle switch and slip the circuit board back over its mounting posts,



carefully pushing the extra wire out of the way under the circuit board.

The wire connected to the hole near contact 13 should be kept far enough away from the mounting post that it is not pinched by the other shell half when the cartridge is reassembled. Put the two shell halves back together, and you are finished, except for cleaning up all that mess you made!

Done—Toggle On/Off As Needed

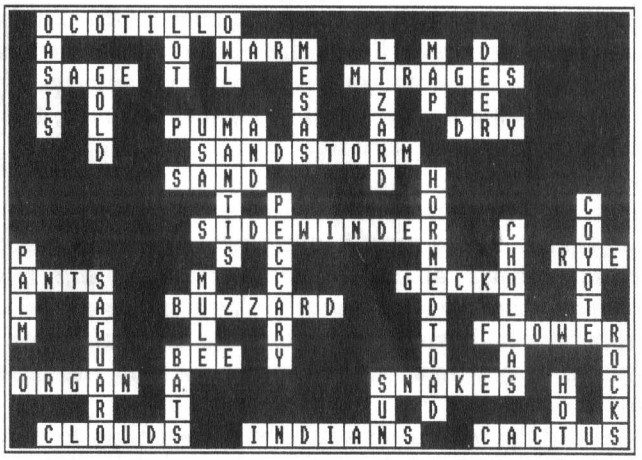
Now, no more plugging in and unplugging of the SpartaDOS X cartridge when you want to run software that is not compatible with the cartridge! A simple flip of both toggle switches will turn it off or back on, and you can leave it plugged in permanently! If you piggy-back another cartridge into the top of SDX it, too, will be turned on and off by these switches, so you may need to rearrange your cartridges. I keep BASIC XE plugged in all the time, but any time I am using it I am also using SpartaDOS X, so that presents no problem.

But, Power Down Before Flipping

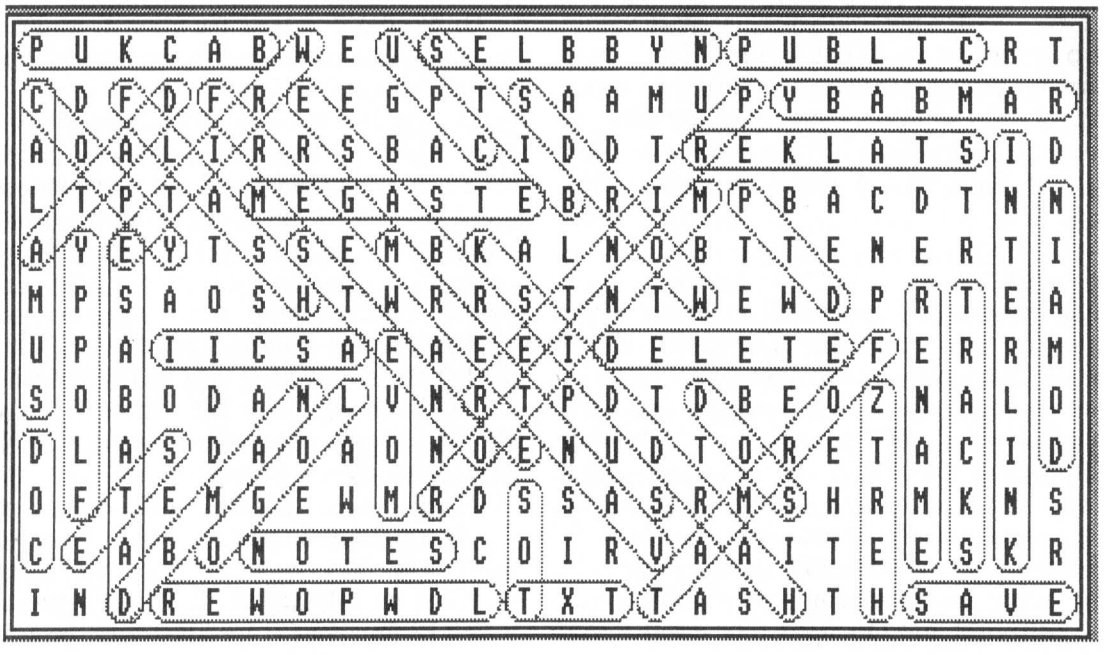
I would recommend that you power down before flipping these new toggle switches on or off, though. I'm not sure what it might do to the cartridge or your computer if you flipped them while your computer was on. Turning them off may be no real biggie, but turning them on might fry something.

Adding toggle switches is one of those things that makes you wonder why ICD never thought of it when they were designing the cartridge. This modification might even work with other cartridges, although they will not have holes in them to solder to like the SDX.

ANSWERS to the puzzles from pages 72-73. But, don't look now, try the puzzles first!



Created with Crossword Creator II



Populous II: *Trials of the Olympian Gods*

Playing God Too

by Mike Heininger, (c) 1992

II Too Too

It's always tempting to play God, especially in the privacy of one's own personal computer. But even for only about $40, the price can be a bit steep, when loading the game and playing with limited powers drag like Sisyphus pushing a rock uphill for eternity.

Populous II from Bullfrog Productions tempts the power-crazed in all of us. Subtitled *Trials of the Olympian Gods*, this version has more divine punishments to inflict. The catch is, you have to progress through all sorts of worlds and tribulations to sufficiently increase your mana.

No shortcuts here. No play-like-I'm-invincible beginner practice mode as in all the good flight simulators. Leap in and challenge the big kids (other deities) or forget it. Yep, you gotta *earn* omnipotence (i.e., all those swell afflictions like hurricanes, volcanos, tidal waves, ad crusheum smashicus).

No Easy Disasters

Which means most fringe benefits of being a god require substantial investments of time, tedium, and torment. You have to patiently play the side of Good vs. Bad through more worlds than the rings of Dante's *Inferno* before being able to inflict some of the most divine disasters.

Initial power consists mostly of the ability to raise and lower land, thus inhibiting or creating level farmland. (Yawn.) This stimulates your people to multiply and prosper and—in the process—increase your mana.

You also get a chance to dab towers of fire here and there among your opponents. The fires are uncontrollable whirlwinds, so don't light them too close to your own people. The fiery pillars burn out after touching any of the water so abundant in the initial world.

Chess Run Amok

Although intriguing, *Populous II* at times is too much like a chess game run amok. The good and bad populations do their own things, occasionally altered by intervention from rival deities. Lest the One God proponents be offended, this game revives the mythological multiGod competitions between son gods spawned from Zeus' legendary liaisons with Earth women (e.g., Leda and the swan—imagine Zeus in feathers). Good thing this is a family game.

The idea is you are demanding your rightful place among the gods on Mount Olympus. The catch is you must defeat 32 divine opponents who rule the 1,000 worlds of *Populous II* (the box says there are billions of worlds to conquer—a slight exaggeration, we hope). Theoretically, it is possible to skip some worlds—but I wouldn't know, bogged down as I am in exasperation without dweeb mode.

The artists are fond of portraying themselves as creative lunatics. That's understandable—it takes a special sort of people to write this special sort of game. The concept and graphics are impressive, but the loading and game play often are not.

Not an Easy Load

You should get awarded triple mana just for figuring out how to load this game. *Populous II* claims it will load on hard disk, and even has an install program ala IBM compatibles, for which this obviously is aimed. But try that at your peril.

I had six megabytes left on an 11-megabyte partition (F) on my 44-megabyte Supra removable hard disk drive. The install program took a long time, then announced there was not enough room on the disk!

After I cancelled the load, *Populous II* wouldn't regurgitate the space it overfilled: the program was nowhere to be seen, but my six-megabyte space had shrunk to 370k. Apparently, *Populous II* couldn't cleanse itself properly after doing its business on my partition, and my sturdy TOS 1.2 was too fastidious to repair the damage.

Only after I erased partition F and reloaded the other four games there did the mission space restore itself to full availability.

So how to load this fickle game? Sparing you a couple hours of aggravation trying everything from auto starts to clicking on folders after normal starts, here is the (blush) first way I coerced this prima donna to play:

Loading the Hard Way

1. Forget about loading it to your hard drive.
2. Put the *Populous II* disk in Drive A and boot normally through your hard drive, if you have one.
3. Click on A to open the *Populous II* disk.
4. Open the Auto folder.
5. Click on FIXIT.PRG. Your screen will twitch downward an instant.
6. Exit the Auto folder.
7. Click on POP2.PRG. This is what you would click on IF *Populous II* installed itself properly on your

hard disk.

8. Wait patiently through some dark screens and flashing cursor screens. Eventually you should see the title screen.

Wasn't that fun? Makes you want to run right out and buy copies for all your friends, doesn't it? Really great sapping your computer's juice with all those UNNECESSARY BOOTS because some people can't make an easy loading program! Geez!

Oh Yes, the Space Bar

By now the developers are rolling on their floppies with hysterical whoops. Because, you see, you also can do the auto load and—after futilely stroking gobs of keys to try to transition past the scrolling Bullfrog logo—just tap *the space bar* to goose the damn frog into opening the program!

Oh yes, the space bar. Everybody knows that. That's why *nothing* is written about it in the manual or ST addendum. Good thing all us consumers are so intelligent. Sure saves the programers and editors lots of time IN WRITING OBVIOUS AND NECESSARY DETAILED INSTRUCTIONS TO MAKE THEIR $&*¤*$% PROGRAMS WORK EASILY AND PLEASANTLY.

...the toys of the god's need to be made immediately available...

Who's shouting? I'm calm. Just because some programs are pleasant and fun to load doesn't mean *all* of them should be. Computer games? Oh, it's delightful to spend $40 for cantankerous products with bizarre copy protection and code words. Ounce for ounce, name one other consumer product that is a greater expense and nuisance to operate than a computer game.

Find the Deity

To be fair, let's admit that it is easy to copy the unprotected *Populous II* disk. Code protection requires simply keying in the number beneath the appropriate god's face in the manual—inconvenient, but about as painless as game protection gets nowadays.

However, when you finally get the program going, and after endlessly ploughing through a reasonably clear manual about a complex concept, how frustrating to realize you can't dabble with the most interesting divine powers until you tediously advance through a bunch of worlds and deities you may not be totally ecstatic with.

Sure, isn't such endless tease the key to strategy games? Well, their programmers could take a clue from the simulators—offer a practice mode with invincible powers and full offensive capabilities so dweebs can get feverish right from the start. This simple concession to browsers could quadruple sales.

Ancient Game Killer

As it is, *Populous II* and its genre flirt with an ancient game killer: Tedium. I resisted the original *Populous*, and yielded only reluctantly to *PowerMonger*, which has a much more interesting beginning sequence that runs pretty painlessly, although also not on hard disk.

Granted, the graphics in both *Populous II* and *PowerMonger* are fascinating—reminiscent of the holograph game in *Star Wars*. And the idea of essentially random human events altered by whimsical or sinister divine intervention remains captivating.

But in practice, it isn't difficult to get bored raising and lowering land to spur population growth, generating little leaders who become bigger leaders, and basically watching blue- or red-clad people and their settlements sprout like dandelions until they inevitably clash in little smoke clouds punctuated by grunts.

What does it take to hold a deity's interest? Plagues, vegetation, swamps, fungus, roads, walls, earthquakes, batholiths (underground rock movements), lightning, whirlwinds, storms, hurricane winds, fire columns, rains of fire, volcanos, tidal waves, whirlpools, baptismal fonts (holy wāter pools that convert believers into the opposite faith)—aren't these enough?

Even though these toys of the gods definitely need to be made immediately available in something like a practice mode, probably not. Too ... impersonal. Not enough ... pizazz.

How About Superhumans?

Then what about superhumans: Perseus (hero), Adonis (vegetation hero—there's a switch!), Heracles (double strength), Odysseus (fastest hero), Achilles (speedy hero with head of flames who burns everything in his past—strange? you bet) or Helen of Troy (leads men to watery graves ala sirens).

Yes, heroes enhance the options—mythology with a twist. But remember when you were a kid. How many things could you do to an anthill before wandering away, bored stiff. We can only hope any real subdeities have an equally brief attention span.

Like the most sadistic arcade game, *Populous II* can wear out your hand joints dabbing the pointer on your own dwellings to spur population growth or reducing hills to level land. The pace can get even more frenetic dropping the land out from under your bad opponent people so they drop into water and drown.

Auto Mayhem

Now don't get excited—this is not as alarmist as the 1970ish California arcade game where automobile

drivers earned points by mowing down pedestrians, including bonus points for squashing them on the sidewalks. Puhlease (sniff) ... we're talking fantasy, not Who, me? or What, me worry?

Actually, the most enjoyable way to play *Populous II* is to click on the computer vs. computer option. Then sit back and scroll to and fro, watching all the effects while saving your tendons. Intervene as you wish, though you'll probably find it just as much fun to let the computer explore all the options, especially creating heroes—Spartan-like ruffians who tramp about eliminating all opposition.

In play and concept, *Populous II* is much like its antecedents, *PowerMonger* and *Populous*. *PowerMonger* has just been updated with a scenario disk (that requires *PowerMonger* to operate) called *World War I*. Yes, the wee ones learn how to make rifles and tanks and airplanes in their struggle for dominance.

Most Popular Strategy Game

Everyone has a special way to categorize games. In the 14 game categories of *ST Action* magazine (the ST games specialist), *Populous II* leads the Strategy category; *PowerMonger* is second. Because I favor simulators, the only other strategy games I've bought of the 20 listed are *Sim City* (ranked sixth) and *Railroad Tycoon* (rated 10th).

Strategy games can quickly become complicated studies. Yet that is a major part of their appeal. Mine are candidates for long rainy day intrigue. *Populous II* and *PowerMonger* are deservedly famous for their holograph-like creativity, graphics, sound, and depth. *Sim City* and *Railroad Tycoon* are more like animated *Monopoly* games.

If playing god appeals to you, *Populous II* probably is as safe as any way to get it into your system. Pantheism is as presumable as monotheism is sacrosanct, exemplifying the fine line between myth and belief.

But keep your sense of humor or risk the consequences of another adage: Those whom the gods would destroy they first make mad.

[Tested on Mega ST4 with blitter off and AdSpeed off, TOS 1.0. Could not load on hard drive; played from floppy drive with loading problem explained in text. Can be bought for about $40. Disk not copy-protected, but manual required for answering code question. The Atari version has no music or ability to exit to desktop. English import from Electronic Arts, Langley Business Centre, 11-49 Station Road, Langley, Berks, England SL3 8YN—Tel: (0753) 549442. In U.S., P.O. Box 7578, San Mateo, CA 94403-7578—Tel: (415) 572- ARTS).]

Have You Seen

```
PATH=C:\GEM_FONT\
100p screen.sys
01p screen.sys
02p screen.sys
ATSS12HI.FNT
03p screen.sys
ATSS12CG.FNT
04p screen.sys
ATSS12HI.FNT
21 FX80.SYS
ATSS12EP.FNT
31R META.SYS
ATSS12MF.FNT
```

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From the groan I can tell that GDOS has got you down!

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The G_MAN

GDOS Font Installation Utility

Whether you use GDOS G+PLUS or FSMGDOS, you need the G_MAN!
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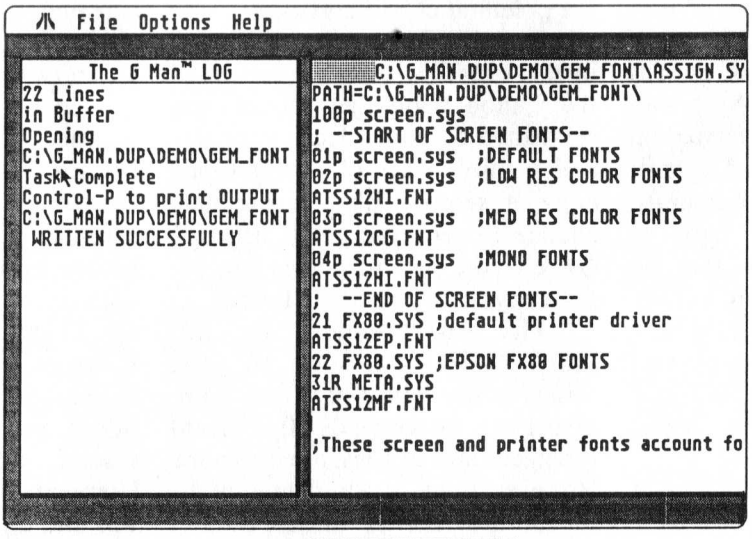
Do you use G+Plus for different lists of fonts for different programs? The G_MAN can create them with only ONE font folder ! No need to duplicate fonts all over your hard disk and waste storage. The G_MAN will do all but the simplest tasks for you!

YOU DO NOT NEED TO KNOW EVERYTHING ABOUT GDOS TO USE THE G_MAN!!!

Get your Computer WORKING FOR YOU not you for your computer!



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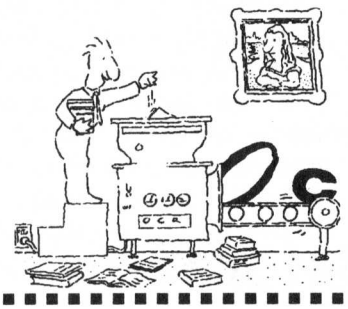


How Fast Can You Type?

by Joe Waters

MIGRAPH OCR

Migraph has specialized in products that revolve around the graphics capabilities of the ST. *TouchUp* is a drawing program that lets you work with IMG and other format graphic files. The Migraph Hand Scanner allows you to scan images for use in desktop publishing or other applications. The Migraph scanner tray and their *Scan and Save* software makes using the hand scanner somewhat easier. Migraph's *Merge It*, is a handy utility that allows you to merge the left and right sides of a scanned image into a single image.

Recently, Migraph has introduced another product that builds on its expertise in working with images, *Migraph OCR*. This program examines the pattern of dots in a scanned image and converts it into standard ASCII letters. (ASCII is an acronym for American Standard Code for Information Interchange, a widely used system for encoding letters, numerals, punctuation marks and signs as binary numbers.) Imagine that, no more typing! Just scan in an image, use the Optical Character Recognition (OCR) software to convert the scanned image to text, use your favorite word processor to correct any errors, and you are done.

How does this all work out in practice? Well, that depends on a lot of things. Let me relate some of my experiences scanning and you can judge for yourself.

A Good Test Case

When I first received *Migraph OCR*, I quickly tried to scan in a couple of letters I had received for the "Letters to the Editor" page. One represented excellent original copy, having been produced on a laser or good 24-pin dot matrix printer. The other represented a poor original copy—a 9-pin dot matrix draft copy on flimsy paper. The first letter scanned in fine, and the OCR process did convert most of the letter pretty well, but it took quite awhile to accomplish the task. In fact, I suspected I could have retyped the whole page quicker. The second letter scanned in all right, but the OCR was useless in converting any of the letters. Since time is usually my biggest constraint, I put *Migraph OCR* aside and typed in the rest of the letters that month. I thought I would return later to more carefully explore the potential of this software.

One of the articles appearing in this month's issue, the review of the Canon bubble-jet printer, was submitted on paper. Here were five and a third pages of nicely typed copy. It seemed like an excellent chance to see how much *Migraph OCR* could help in converting paper copy to an electronic format.

The advertisements for *Migraph OCR* have a lot of good things to say. It is easy to use, state-of-the-art, understands 20 different typefaces and can learn even more. However, none of the details of its capabilities matter if it doesn't work. So, let's see how it works.

Scanning Basics

Before you can convert a typed or printed page of text into ASCII text, you have to get that page, somehow, into the computer. Most people just sit down and type it into their word processing program. However, with the advent of OCR there is another option. Scan the page in and convert the scanned image to ASCII text.

Scanning is done with a scanner, a relatively expensive device, somewhat like a copying machine, that "scans" an image and converts what it sees into a pattern of black and white dots that are stored in the computer as an "image" file. These imagefiles can then be imported into desktop publishing programs for use in your own publications.

Of course, a scanner, like a printer, won't do anything by itself. It needs software to control it. Some software may support a variety of scanners. Some scanners may only work with the software supplied with the scanner. You will need both a scanner and appropriate software to capture an "image."

Canon makes a number of scanners. Several years ago, Navarone took two of the Canon models, a flatbed scanner and a sheet-fed scanner, and added an interface to make these models work with the Atari ST series of computers. There were quite a few full size scanners on the market at the time. If you had an IBM clone or a Macintosh, you could have chosen from several different brand names. However, if you had an Atari, this was the only choice. The cost was well over a $1,000 with the flat-bed scanner costing about $200 more than the sheet-fed model. Either of these models could handle a full 8 1/2 x 11 inch page. *Current Notes* purchased the Canon sheet-fed model. Our ST editor purchased the flatbed model.

Navarone scanning software, supplied with the scanner, is called *ST Scan*. The options available here, which are similar to those available with other scanners, are fairly limited. The user must choose an output format. On the ST, this is usually Degas or IMG. You have to choose the resolution you want to capture. The highest resolution available on the Canon is 300 dots per inch (dpi). This will provide the best possible rendition of the image, but it does require a lot of dots.

If you want a Degas file, which are all a fixed size of 32K, the higher the resolution you scan at, the smaller will be the image you can capture.

A monochrome monitor shows an image that is 640 dots by 400 dots. Scanning an image at 300 dpi means that only an area just a little bigger than two inches by one inch would fill your screen. If you scanned an image at 100 dpi, an area 6.4" by 4" would fill your screen. (See Dave Small's column on "The Role of Video Memory" in the March 1991 issue of CN for a complete explanation of dot patterns and storage requirements.)

IMG files do not have this size restriction. The two by 1 inch rectangle mentioned above would still be 32K at 300 dpi, but now one could also scan the 6.4" by 4.0" image at 300 dpi as well. Of course, the resulting file would be almost 290K. A full page scan, say 7 inches by 10 inches, would take up nearly 800K. The IMG format can handle these big files, although your floppy disk can't and some software may choke when trying to import a file this big. But if you are going to scan in full pages of text, the first thing you must understand is that you will be dealing with big files. You will need, therefore, big memory and big hard drives. At 800K a page, a six-page paper requires almost 5 megabytes of storage just to hold the 6 image files. Of course, the final ASCII text file you produce from these 5 MB of data is likely to be less than 10K.

Not everyone can afford to spend huge sums just to buy a full-page scanner. There are, fortunately, other options available for the economy-minded. A "hand-scanner," together with Migraph's *Touch-Up* program, can be purchased for under $300. The hand scanner, as its name implies, allows you to scan an image "by hand." The scanner only covers a width of 4" so scanning a full page would take two or more passes of the scanner. If you are scanning a page that has two (or three) vertical columns, you can capture each column in a single image file. If the page has only one column, you would have to scan paragraphs horizontally or, alternatively, scan the left side and then the right side and, somehow, merge the two images into one. *Current Notes* also has the Migraph hand scanner and we will talk more about this later.

Scanning Documents

Now that you know a little about scanners, let's see how they work. With the Canon scanner, you first select your options. I chose IMG format, 300 dpi, and line drawing (as opposed to half-tones, which are used when scanning photographs). Next, you scan in a full page. Put the sheet in the scanner and tell the program to start scanning. A minute later you see a representation of your full page on the screen. Of course, you cannot exactly read anything, but the picture is good enough to see the general layout of the page.

The next step is to select the area of the page that you want to capture for your actual image. For an IMG format this involves setting a box, any size you want, around the portion of the page you want scanned.

With the area now specified, you select the "Scan Window" option. You are prompted, again, to load in the paper and the sheet is scanned a second time (about 30 seconds).

At this point you will see the scanned image on your screen. Simply save it to disk (another minute or so.) There, that takes care of page one. You can repeat the process for each page. However, in the case of this article, the text on each page appeared in the same general area so I didn't have to scan in the full page again. I could use the same image size that I specified for page one. That saves a minute a page. So I did that. Twelve minutes later I had scanned all six pages of the article and saved them to disk.

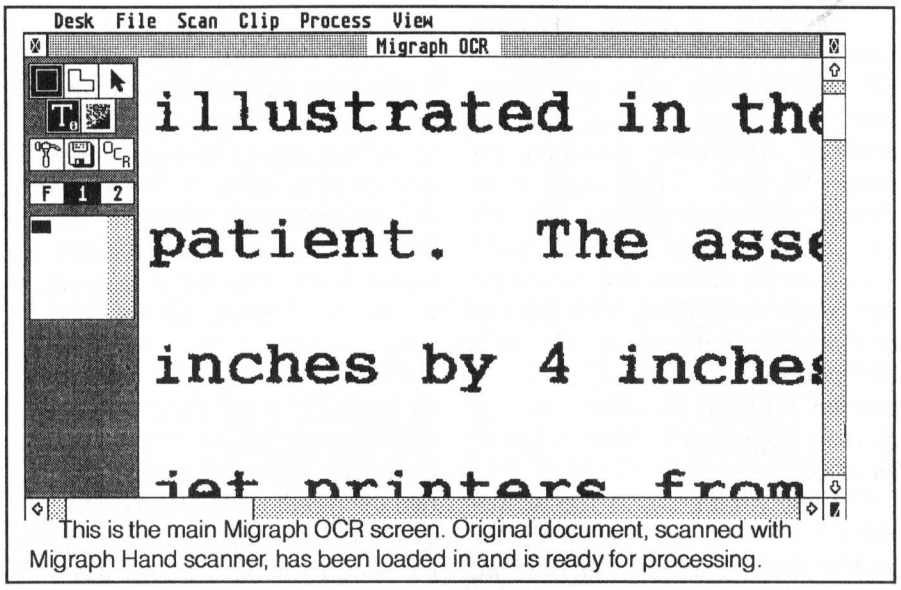
Actually, it wasn't exactly that easy. I did, indeed, scan in the six images as stated above. I then went into the OCR program and, when the first image was loaded, was dismayed to see that I had, somehow, not captured the whole page. The image was truncated on the right by four or five letters. I must have made the scan image box too small. Dummy!

So, I repeated the whole process again. This time I made sure that the box was clearly big enough to capture all the text. I scanned all six images, went to the OCR program and loaded in the first image. Yep, text on the right still miss ing. @#&!*&#@. Was there something wrong with the OCR program??? I loaded *Pagestream* and tried importing the image file. The file came in fine and I saw that the image file did not have all the text.

Ah, ha! The scanning software, *ST Scan*, was not saving enough of the image. But hadn't I gotten an upgrade to that software? Now where was that upgrade? Half an hour later I gave up trying to find it among the myriad of disks around my house. So, I called our esteemed ST editor and asked him what version of *ST Scan* he had. It was, indeed, newer than mine. Through the wonders of modern telecommunications, he quickly sent me the new version.

Using the newer *ST Scan* software, I tried a single page to see what would happen. It worked fine.

All of the image was captured, and saved, appropriately. So, once more, I scanned all six images. That took the 12 minutes mentioned above. I figured it wouldn't be fair counting the two hours it took to get that point.



This is the main Migraph OCR screen. Original document, scanned with Migraph Hand scanner, has been loaded in and is ready for processing.

Converting Images to Text

In spite of the complexity of the algorithms employed, *Migraph OCR* is really a very simple program to install and run. To install the program, put in the Migraph master disk, run the *Install* program, and you are done. This creates a folder containing all the OCR software. Open the folder and run the MI–OCR.PRG.

To convert an image to text, load the image, set a few options, tell the program to do the conversion, and save the results. Now that doesn't sound hard, does it?

You can load the image from a file (I had just saved six files, one per page), or directly from a scanner. *Migraph OCR* supports the Migraph, AlphaData, and Golden Image hand scanners. It does not currently support direct loading from the Navarone (Canon) full page scanners.

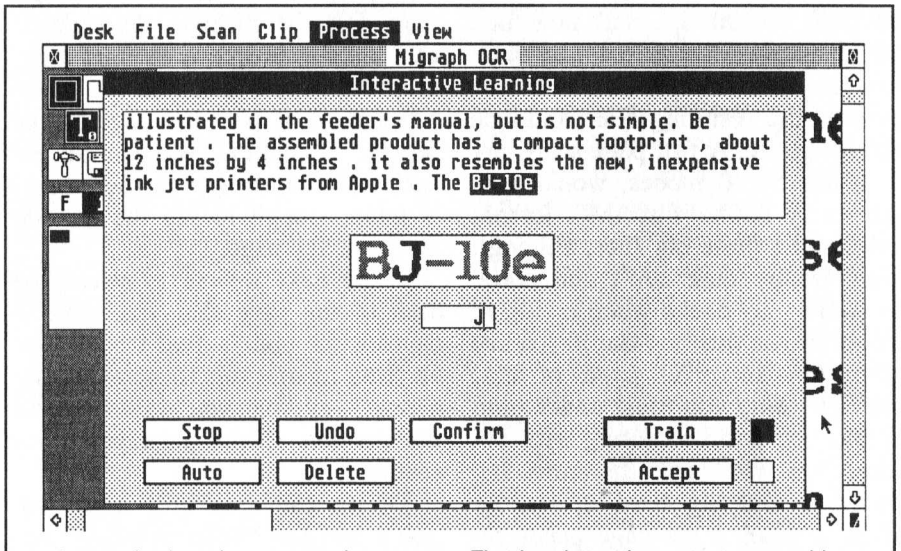
With the image loaded, you need to define the particular parts of the image you want converted to text. If you define nothing, it will assume you want to convert the entire image. To define subsets of the image, a clip box option lets you define one or more boxes of text. The clip box options are quite versatile and should let anyone identify just those parts of the page he wants scanned.

You can actually start scanning now if you want to accept all the program defaults. However, you may not want to do that. Select the Control Panel and specify a filename for your ASCII text output file, whether this is a "new" file or whether you want to "append" the text to this file, whether you want to capture the text line-by-line, or by paragraph. The program has a built-in dictionary that it uses, but you can also specify a new dictionary to hold any special characters you train the program to recognize. You indicate whether the text is "fixed" or "proportional," and, finally, whether you want to invoke "interactive learning."

Interactive Learning is an important option. If you use interactive learning, the program will process your file, figure out everything it can and then present you with its best guess for each character that it is not quite sure about. Sometimes it guesses correctly; sometimes, not. You can correct the guess and decide whether or not to "train" the program to remember that the particular pattern of dots it saw is the letter you indicated. I chose the interactive learning option.

The OCR Process

OK, we've set all the options; let's go! Under the "Process" menu, select "OCR." The program then begins doing its thing. It goes through several steps. It first tries to figure out where the lines are on the page. Next, it has to separate one word from another and then



Interactive learning process in progress. First box is text in context; second box is word under consideration (BJ–10e) with letter in question in bold; third box is OCR guess at letter (correctly identifying capital J. Options on bottom let user train the OCR or merely accept the selection.

one character from another. With characters isolated, it can then try and figure out just what each "character" is. On my first page, all this took about two and a half minutes.

If I had not chosen interactive learning, the program would simply save the text to the specified output file. However, with interactive learning, it gives the user a chance to check each "guess." It presents a screen with several boxes. The top box has the text of the document, in context. A second box shows the outline of the dot patterns for the word it is working on with the specific letter in question in bold. A third box shows you what it "thinks" the letter is. (See illustration.) You can accept the guess or correct it. You can also tell it whether you want it to learn this letter or just accept it. (If the dot pattern is distorted, but you, because you can see the context, know the correct letter, you may want to insert the correct letter, but not train the program for this particular case.)

The length of time this process takes depends on how many characters are presented to you and how long it takes you to respond to each one. I was getting from 60 to 90 choices per page. It seemed to be having quite a bit of trouble with some characters. The whole process of loading, analyzing, training, and saving the text output was taking anywhere from six to eight minutes per page. But, 40 minutes after I started, I had managed to convert the six IMG files into a single text file.

The Text Output

Well, that took quite awhile, but let's now take a look at what we produced. How many errors were still in the text? Each page had about 1,600 characters on it. On the first page, I found 14 errors. However, 10 of them were cases where *OCR* had put in a capital "Y" when it should have put in a lowercase "y." This option was not offered in the training. Here was a case where the OCR thought it had the right letter, but it didn't. (Or could I have, early on, trained it incorrectly???)

The second page had 9 errors. The third page had 71 errors. (This was a page where I tried to skip the interactive learning mode.) The fourth page had 4 errors. The fifth page had one error in the first two paragraphs and then the rest of the page was just a mess. It seemed to be mixing the left and right sides of each sentence. On this particular page, the author had written in by hand an extra word, which he had forgotten originally, in the space between two lines. Obviously, the OCR line algorithm became confused with these extra characters and, somehow, messed up the rest of the lines on the page. (I "whited" out the handwritten addition and scanned this page again. More on this later.) The final page only had one paragraph, with 15 errors.

All told, the results were discouraging. There seemed to be a lot of errors from what, I thought, was good input text. However, I noticed that the text in the image file seemed to have white streaks through it that were not evident on the original. In many cases, it was these "streaks" which were fooling the software. A dash "-" with an extra streak through it can easily be confused with an equal "=" sign. Similarly, a period might look like a colon. These represented many of the errors the program presented during the interactive learning.

Scanning Quality

Maybe my scanner was at fault. In a sheet-fed scanner, the page is fed into the front of the scanner and then physically pulled through the scanner until it exits at the back. If the mechanism feeding the paper, or the paper itself, did not move perfectly smoothly, then the scan might have "gaps" as represented by the streaks seen on the screen. This would mean that, although the original text was fine, the scanner produced an inferior image of that text. I would have to do some experimenting to find out if this was true.

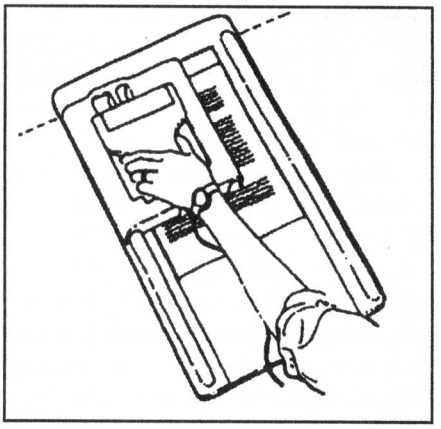
To do all my experimenting, I took just one single page from the article (page 5) and ran all my tests on the same set of characters. I took the text output from that page, loaded it into *ST Writer*, and then printed it out on my HP LaserJet IIP printer. This used a standard Courier font and produced perfectly legible laser output.

I fed this HP page through the Navarone/Canon scanner and loaded the image into the *Migraph OCR* program. The streaks were still there. The problem was not in the original text, it was in the sheet-fed scanner. We couldn't give the *OCR* a good test without giving it a good image. I would have to switch to another scanner.

Scanning by Hand

I had purchased the Migraph hand scanner when it was first introduced. It scanned ok, but scanning by hand was not all that easy. In fact, just trying to keep the scanner going straight was a major problem. For this reason, when Migraph recently introduced their scanning "tray" to facilitate use of the hand scanner, I purchased it. Of course, with CN's schedule as busy as it is, I hadn't really had a chance to pull out the tray, or the software that came with it, and try it yet. Well, it looked like I would have to do that now.

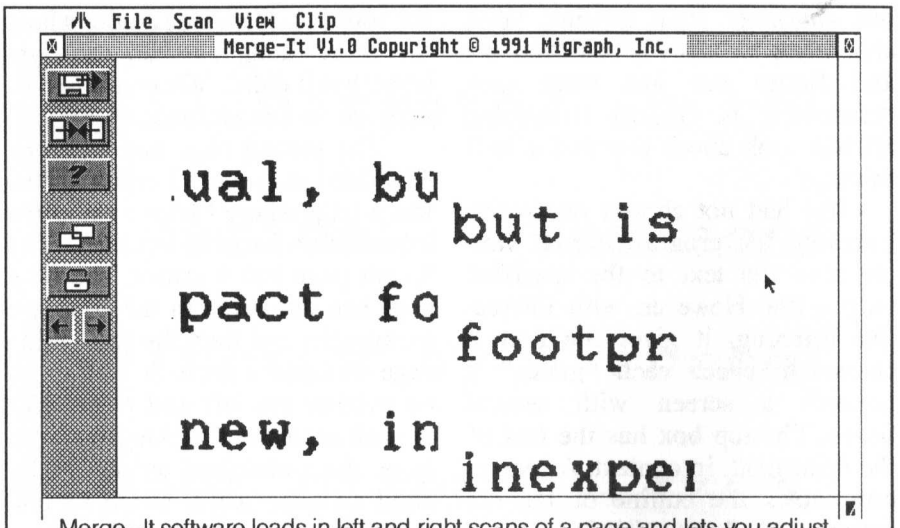
The scanner tray is made of a durable precision-molded plastic



and measures about 22 inches by 12 inches. That's problem one. I don't know about you, but finding enough desk top to take care of a mouse pad and a mouse is sometimes a problem. How does one come up with 22 x 12 inches within cord reach of your computer? There was no way I could do it by my computer, but it was possible on Joyce's Mega STe if I moved the keyboard all the way back and stood it vertical.

The setup includes a cradle to hold the hand scanner and the tray. The cradle worked fine. The scanner fit right in with no problem. The tray has a clear plastic sheet that one lifts to put the page to be scanned under. The clear plastic keeps the page from shifting. That worked beautifully. The cradle is molded on both the left and right so that it can fit, and ride, over ridges in the tray body on either the left or right side of a page. With the scanner in the cradle and the cradle sliding along the molded ridge, there was no longer any problem with producing a straight line scan with the hand scanner.

The scanning tray comes with two programs, *Scan and Save*, and *Merge-It*. The first is for, as its name implies, scanning an image and saving it. I used it to scan the left side of the page and then the right side of the page. The *Merge-It* program is used to merge the left and right sides into a single IMG image file. Both programs worked perfectly well. However, in the process of merging left and right sides, I noticed some more problems in working with the hand scanner.



Merge–It software loads in left and right scans of a page and lets you adjust them until they are even and then merge them into a single image.

I would line up the first few lines of the left side with those of the right side until characters all overlapped perfectly. I then locked both sides into place using the *Merge-It* software. But, when I reviewed all the lines on the page, I discovered, in some cases, that, somehow, a scan line or two may have been missed in scanning and the text lines did not line up evenly at the bottom of the page. This might happen if, when moving the scanner, even pressure wasn't applied and the roller skipped a beat here or there. If there was a big gap, one could just scan the offending side again and try merging once more. The point is, although scanning straight was now easy, scanning with a steady even flow by hand was still a bit of an art that would take time and practice to master.

Comparing Results

Well, now that I had scanned the original page 5 with the Migraph scanner (left side, right side, merge into single image), how did the *Migraph OCR* perform on this image? When I loaded in the file, I could see right away that the extra "streaks" weren't there. The scanned image was, indeed, better than the one produced with the Navarone/Canon scanner. This time, the OCR process took only two minutes (versus three) and the interactive learning only presented 37 guesses. Of these, 32 were correct.

To see how well "training" the program worked, I ran the page through once using the training option and creating a special new dictionary. I then tried running the page through a second time, using the dictionary I had just created, but with no interactive learning. When the OCR was finished, it just saved the file as an ASCII file. By counting the number of "errors" found in the resulting ASCII file, I could get a measure of how well the OCR process was performing. On the Migraph scan of the original page 5, I found only 1 error in the 1,576 characters on that page. Pretty solid results.

When I did the same experiment on page 5 using the Canon scanner, I found 24 errors in the

Scanning/OCR Performance.

Copy	Scanner	Interactive Training			After Training	
		Guesses	Correct	Err[1]	(min)	Err[2]
Original	Navarone	61	35	1	3	24
Original	Migraph	37	32	0	2	1
Original	HP ScanJet	18	17	0	1*	0
HP LJ II	Migraph	38	37	1	1.5	1
9-Pin LQ	Migraph	55	50	1	1.5	5
9-Pin Draft	Migraph	too many to bother with				

[1] Errors on final text copy with interactive training.

[2] Errors on final text copy after training.

*This was run with STE at 16MHz.

text output. This gives you some indication of the problems generated by images that are not a good reflection of the original text.

But what about the original text. How did the OCR perform on that page when it was printed in Courier off the HP LaserJet? The interactive learning process identified 38 guesses, 37 of which it had guessed correctly. The second pass produced a text file in one and a half minutes with only one single error on the whole page.

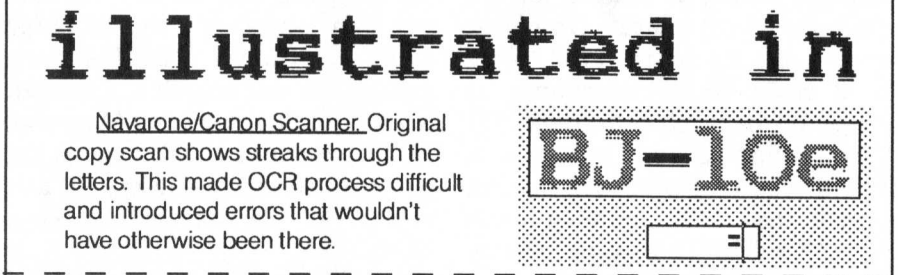
I printed page 5 on a Panasonic 9-pin dot matrix printer, once in draft mode and once using the letter quality option. I scanned in both pages using the hand scanner. The 9-pin draft copy was completely useless. The dots were so far apart on each character that training would have been virtually impossible. For example, the OCR thought the "b" in the word "but" was really a number 1, followed by two colons and then a right parentheses. If your input is from a 9-pin dot matrix in draft mode, this program wouldn't do you a bit of good.

The 9-pin letter quality copy, however, fared much better. Each letter was darker and more completely formed. The interactive learning process found 55 questionable characters but guessed correctly on 50 of them. The second pass was completed in one and a half minutes and produced a text output file with 5 errors in the 1,576 characters.

How About the Competition

To compare the performance of *Migraph OCR* with hardware/software available on other platforms, I tried scanning in this document using a Mac IIci (68030) with an HP ScanJet scanner and the Caere *Omnipage* scanning program, one of the best available. (This set up represented state-of-the-art about a year or so ago.) *Omnipage* worked directly with the HP scanner, which is a full-page flatbed scanner. It took the HP 30

Original copy scanned with three different scanners: 1) the Navarone sheet-fed scanner, 2) the Migraph Hand Scanner, and 3) the HP ScanJet flatbet.

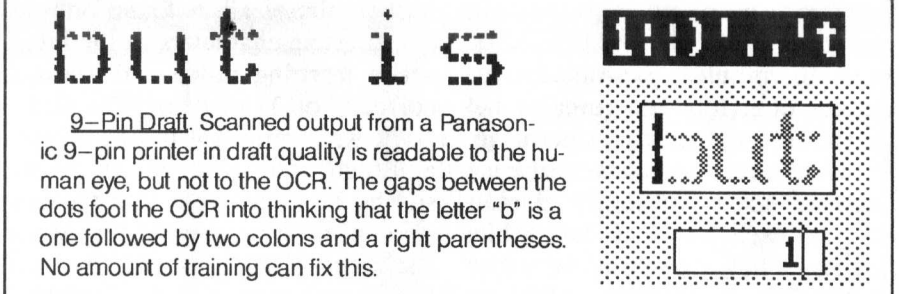


Navarone/Canon Scanner. Original copy scan shows streaks through the letters. This made OCR process difficult and introduced errors that wouldn't have otherwise been there.

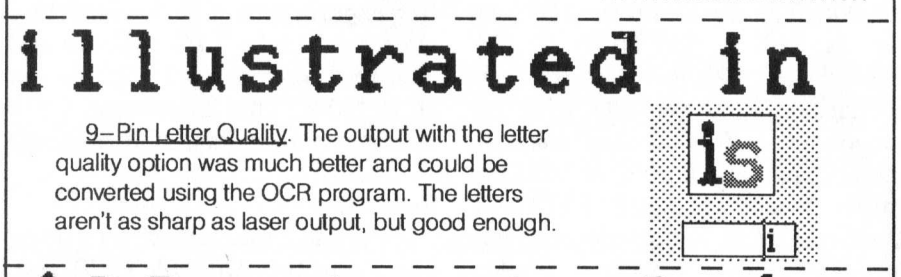
Migraph Hand Scanner. Original copy, scanned in with hand scanner, produced satisfactory results when processed by OCR.

HP ScanJet. Here is a sample of the original copy scanned in using the Hewlett Packard ScanJet scanner. This produced the best quality image.

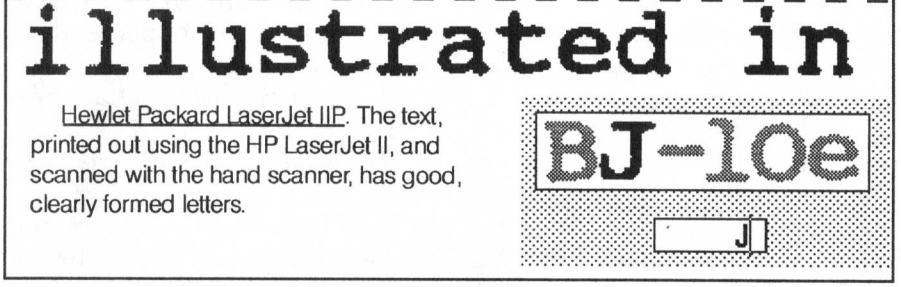
Text scanned with Migraph hand scanner, but originated with three different printers: 1) Panasonic 9-pin draft, 2) 9-pin Letter Quality, 3) HP LaserJet IIP.



9-Pin Draft. Scanned output from a Panasonic 9-pin printer in draft quality is readable to the human eye, but not to the OCR. The gaps between the dots fool the OCR into thinking that the letter "b" is a one followed by two colons and a right parentheses. No amount of training can fix this.



9-Pin Letter Quality. The output with the letter quality option was much better and could be converted using the OCR program. The letters aren't as sharp as laser output, but good enough.



Hewlet Packard LaserJet IIP. The text, printed out using the HP LaserJet II, and scanned with the hand scanner, has good, clearly formed letters.

seconds to scan in an image. That's about the same amount of time it took the Canon to scan in an image. However, since *Omnipage* worked directly with the HP scanner, it could begin processing the image immediately. With the ST/ Canon combination I had to scan in with one program, save the image file, load OCR, and then reload the image file. The saving/loading of an 800K file adds a lot of time to the process. (Migraph has said that an upgrade to *Migraph OCR* is in the works that will allow the program to communicate directly with these full page scanners as well as with the hand scanners. This will speed up the process considerably.)

The *Omnipage* has no interactive learning mode. It goes through its OCR routine and outputs the results. The user can't do anything until the results are loaded into a word processor to see how well the scanning worked. It took *Omnipage* about 30 seconds per page to perform the OCR. Remember that this is on a Mac IIci, which is a relatively fast machine. All told, I was able to scan and convert all six pages in a total elapsed time of about 10 minutes. Examination of the resulting text file revealed between one and four errors per page.

Note: current state-of-the-art scanners boast the ability to scan color as well as black and white images. They are selling for under $2,000. The monochrome HP ScanJet is selling for about $1,100. *OmniPage Direct* software, if purchased in a package with the scanner, is $300. The standard *OmniPage* Ver 3.0 lists for $695 but street price is under $500. Of course, a Mac IIci would cost you about $3,000 with another $600-$700 for a color monitor. All of this is quite a bit more than your Atari options.

How would the *Migraph OCR* perform on the image scanned by the HP ScanJet? The ScanJet had an option of saving the image file in a TIFF or compressed TIFF format. I saved it in both formats. Unfortunately, the uncompressed TIFF format resulted in a file that was over 1 megabyte big. Too large to fit on a floppy disk. The compressed file was only 86K. I formatted a "DOS" disk on my Mac, copied the compressed TIFF file to the disk, moved the disk to my ST, and copied the file over to my Mega hard drive.

Although I had never used it, I recalled that Migraph's *TouchUp* had an option of loading TIFF files. I tried loading the compressed TIFF file. The program gave me a warning message that there was unrecognizable code in the header. I said continue. It warned me again. I said continue. It warned me again. I said continue and then, lo and behold, it started loading something. There, on the *TouchUp* screen, to my amazement, appeared the image of page 5! I'm not sure what all that header stuff was about, but I was able to save that image as an IMG file after all.

I loaded the HP ScanJet produced image into *Migraph OCR* and processed it. This produced the best results of all. It found only 18 questionable characters in the interactive learning mode and guessed correctly on 17 of them. The direct OCR was completed in one minute and there were no errors in the resulting text file. Note that the one minute time was with the Mega STe set at 16MHz. During the earlier experiments, I discovered that what might take 2 1/2 minutes at 8 Mhz took only about 1 1/2 minutes at 16 Mhz. The faster your CPU, the faster will be the OCR process.

Summary

I started this review by asking how well the *Migraph OCR* program worked. My response there was, "It all depends." Hopefully, by now, you have some idea about what it depends on.

For accuracy, the original document must contain clean, clear, text *and* you must be able to get a good scanned image of that document into your machine. If those two conditions are met, *Migraph OCR* will do an excellent job of converting that image to ASCII text.

For quickness, you need a fast computer *and* the ability to scan and convert without having to also save and load image files. The TT or a Mega with one of the 68030 boards should produce the best results. If you are using a stock ST with no accelerator and you have to scan and save, then load your images (or, worse yet, scan left side, scan right side, merge, save and load), it will take a very long time to convert every page.

Whether it is worth it or not depends on how fast you can type. Twelve minutes to scan in 6 pages, 40 minutes to train, convert, and save, means 52 minutes to produce about 1,700 words. If you can type better than 35 words a minute, you can beat that. (Of course on the Mac IIci, this only took 10 minutes. You would have to type better than 170 words a minute to beat that.) If you are a fast typist with a slow machine, OCR is too slow. If you are a slow typist with a fast machine, this could be a big plus.

Another important consideration is the kind of material you want to scan and convert. If you were trying to move a 200 page manuscript to ASCII text, you need only train on the first few pages and then the rest would all go much more quickly. Similarly, if there are some magazines that you regularly read and want to save articles from, unique dictionaries can be created for each format once and then used repeatedly. If, on the other hand, you only work with short text segments, coming from a variety of sources, (different font styles, sizes, etc), you are better off just typing the text yourself.

[*Migraph OCR* lists for $300, the Migraph hand scanner lists for $399, and the scanning tray and software list for $130. Migraph Inc., 32700 Pacific Hwy, S. Suite 12, Federal Way, WA 98003. (800) 223-3729.]

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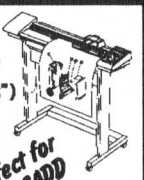

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The MINIX Operating System

UNIX for the Atari ST!

by John H. Marable, III

MINIX is an inexpensive, multiuser, multitasking operating system that will operate on an Atari 520 ST with a single floppy disk drive. Theoretically, while running MINIX on your Atari, you might have several users connected, each running several programs like on main frame computers. Realistically, why would you want to buy a dumb terminal and share your Atari with another user? How many programs would you want to run at the same time? Why would you want a multiuser, multitasking operating system?

Multitasking

The need for multiuser, multitasking operating systems arose when dinosaurs roamed the earth and main frame computers ruled the data processing world. I can remember standing in line with boxes of punch cards waiting to feed them to the big blue monster while it spent most of its processing time and very little of its actual capacity waiting for the next card to be read or spooling output off to the line printer.

Some wonderful computer scientist finally thought of multitasking. If you hooked up two card readers to the computer and buffered them, the computer could move back and forth between two jobs at such blinding speed that the users would never realize that the computer was actually doing two things at once. All that was needed was an operating system that could keep track of both jobs and divide the computer's time between them.

Well, it wasn't quite as easy as that. One of the primary functions of an operating system is to marshal the resources available to the central processor, like: disk drives, memory, terminals, coprocessors, printers, hard drives, tape drives, card readers, card punches, plotters, etc. For example, what if two users both directed output to the printer at the same time? Would the printer print a few characters of output from one user and then a few characters from the next until a garbled mess was printed?

What if when the user's program directed output to the printer, the operating system actually put the output into a temporary file on disk? Then, when the output was complete, another program could print out the files, one at a time from a print queue maintained by the operating system. Now we have more programs crowding into memory and sharing processing time. All this was necessary because so many people had to share a single, expensive computer.

UNIX

One early multiuser, multitasking operating system was called MULTICS. It was never very successful, but a single user version was adapted for use at the AT&T Bell Laboratories. This operating system was called UNIX. It finally evolved into a complete, multiuser, multitasking operating system and has become the most widely used multiuser, multitasking operating system on micro and mini computers.

Many varieties of UNIX were developed, such as COHERENT and XENIX for IBM PC compatibles and A/UX for the Apple Macintosh. Most software developers licensed the source code for the operating system from AT&T and customized it to suit their market. Others developed a UNIX work alike without the benefit of AT&T's help. As UNIX matured, features were often added, but seldom deleted. It grew until it required two megabytes of memory and 30 megabytes of fast hard drive space just to run UNIX.

Enter MINIX

Andrew Tanenbaum decided to write a UNIX work alike operating system from scratch as an intellectual exercise. He wrote most of the operating system in the C language and implemented it on an IBM PC compatible with only 256k of memory and a single floppy disk drive! He wrote all 12,000 lines of source code himself. The resulting operating system, MINIX is call-compatible with UNIX version 7.

But, there was yet another challenge for Tanenbaum, because MINIX was originally written with portability in mind. What better test than to port MINIX over to a machine that uses an entirely different processor with linear instead of paged memory. The resulting port to the Atari ST was accomplished quickly and offered several improvements over the IBM PC compatible version.

MINIX is an educational, rather than a commercial, operating system. It is not widely marketed. I purchased MINIX (ISBN 0-13-584392-8) directly from the publisher, Prentice-Hall. The Atari ST version of MINIX comes with documentation that only describes the differences between MINIX for the Atari ST and MINIX for the IBM PC compatible. You will also need MINIX for the IBM PC, XT and AT - Reference Manual by Andrew S. Tanenbaum (ISBN 0-13--584400-2), which must be purchased separately. Not knowing that I needed this additional manual was my first stumbling block. I also found that a UNIX user

manual was necessary. Most of the UNIX manuals found at any computer or book store will do.

Application Programs

An operating system is useless without applications. Because there are no commercial applications written specifically for MINIX on the Atari ST, Mister Tanenbaum thoughtfully provides you with several, including a Kernighan and Ritchie compatible C compiler, a full screen text editor, a formatting utility, a make utility, an assembler and a linker in addition to over 60 utility programs commonly found on UNIX systems such as cat and grep. With these available, it should be possible to port over any number of UNIX programs from other systems.

Additionally, the source code to every program except the C compiler is provided, including the source code for the operating system itself. If there is something that you don't like about the editor or any of the other applications, modify it and recompile it. A total of nine single-sided disks are included in the distribution, many of which are in a compressed format.

Installation

Installing MINIX is no simple task, but neither is installing UNIX or XENIX. I have had no previous experience with any variety of UNIX, but I trust the reviewers. I have an original 520 ST upgraded to 1 meg and a double-sided drive. I also have a 20-meg Atari hard drive and both color and monochrome monitors. MINIX is provided on single-sided disks like most Atari ST software. By carefully following the step-by-step installation directions in the MINIX Manual for the Atari ST, I had the system up and running in a few minutes. Because I have a double-sided drive, I wanted to move the system to double-sided disks. Fortunately, there is a procedure provided for that in the manual. Unfortunately, there is a line missing from the manual. At the top of page 11 of the MINIX Manual for the Atari ST add the line:

```
#/etc/mount /dev/dd0 /user
```

before the line that reads:

```
#cpdir -msv /tmp/14 /user
```

While I am sure that any UNIX guru would laugh at this "obvious" omission, it took me a while to figure it out. Once I had made this correction I was able to boot MINIX from double-sided disks.

The final task was to establish a MINIX partition on my hard drive and install MINIX there. The big challenge here was to discover that there was no way to install a MINIX partition on my hard drive after formatting and partitioning it using the ISD hard disk utilities. The manual states clearly to initialize the hard disk "using the tools supplied by Atari," but who would have guessed that you couldn't use anything else? I spent days discovering this. I backed up and reformatted my hard drive using the Atari utilities and successfully reinstalled MINIX. As an additional precaution, I manually edited out the MINIX partition icon from the desktop.inf file to prevent accidentally accessing the MINIX partition from TOS. Now, a 5 meg MINIX partition peacefully coexists on my hard drive with two TOS partitions.

Using MINIX

Now that MINIX is installed, what is it like? Well, it certainly isn't user friendly. All those mystical characters that I painstakingly typed to install the system were actually operating system commands used to configure the system and copy files. Just imagine having to tell the operating system every time that you remove a floppy disk from the disk drive and tell it again when you have inserted another disk in the drive. MINIX can't access a floppy disk until you have accomplished this. Also, MINIX must be booted from a floppy disk which bootstraps the MINIX partition of the hard drive. MINIX can alternately be booted from TOS using one of the TOS utility programs provided, but I found that it was easier just to start from the floppy disk.

The command shell that you use to interact with MINIX is like the Bourne shell for UNIX. If you have used *Mark Williams C* or the old *Hippo C* on your Atari ST, then you are already familiar with the Bourne shell. The operating system command shell works in a manner similar to command.com on MS DOS systems. The shell gathers your commands from the keyboard, interprets them and issues them to the operating system for execution. This is similar to the way that the GEM desktop accepts your mouse commands, issues them to TOS for execution and then reports to you the status of accomplishment by updating the desktop. The shell can process batch files of many commands to accomplish complex tasks easily. This is how user friendliness is accomplished in UNIX. But where do these files, or "scripts" as they are known, come from?

Super User

A UNIX system has two types of users, the system administrator or super user and the other users. The super user controls access to the system through a system of passwords and file locks. MINIX faithfully implements the system security features of UNIX including trapdoor encryption of passwords, user, group and open locking of files. (Read the bestseller, The Cuckoo's Egg by Cliff Stoll for a most interesting description of the UNIX system security and networking features.)

There are several functions that can only be accomplished by identifying yourself to the system as the super user at log on. This super user is the guru who sets up the system file structures and writes the scripts that guide each user through the system when that user logs on. For example, a simple script command can be written which will unmount the floppy disk in drive A:, wait for the user to respond to a prompt printed on the screen to hit return when the new floppy is installed, and then mount the new floppy disk.

On MINIX, you are the super user. Whatever you do, don't forget your super user password, or you will have to reinstall the system. (I know this from experience.) MINIX only becomes user friendly when you become an expert at the command shell, and it will never be intuitive.

Multiuser?

Now, is MINIX multiuser? Technically, yes, but realistically you need to be able to connect another user to your ST first. MINIX talks to input/output devices through software modules called device drivers. The purpose of the device driver is to make each particular input/output device look like some arbitrary "standard device" so that applications may address each device in a similar manner. MINIX comes with device drivers for the screen (in text mode only), the keyboard, floppy drives, hard drives, and the printer. If you are lucky enough to have a MegaST, there is a driver for the clock. Unfortunately, there is no driver provided for either the serial port or the MIDI port. If a device driver was installed for the serial port, then the super user could tell the system that the serial port was a second user and your friend could run programs on your computer via modem. There is a serial port driver available on the bulletin boards, but installing it in the operating system might be difficult. There is also a screen driver available which can output to the screen in graphics mode.

Is MINIX multitasking? Definitely! I dumped as many tasks as I could on to the system. I could slow it down, but I couldn't stop it. From the source code, it appears that as many as 16 tasks can be run at the same time. Of course, if that is not enough, you could just modify the source code for as many tasks as you have memory for. The screen became a jumble as output and status from the various tasks was displayed, all at the same time.

One thing that made process management difficult was the absence of the UNIX PS utility that is used to monitor the process status of the various tasks running on a UNIX system. Fortunately, a dump of the process table can be obtained by pressing Ctrl-Alt-F1 producing much of the same information and also information about kernel tasks. MINIX's "pipes" can be used to redirect screen output from a process to the printer or to a disk file for later review to prevent the screen clutter from several tasks running at the same time.

If a single processor is performing two tasks at the same time, logically, it can only spend half of its time on each task. Therefore, each task will only run half as fast at best. Additionally, some computer time is used while the processor switches between tasks. I used the dhrystone benchmark program provided with MINIX to test this task switching efficiency. With a single user task, my Atari benchmarked at 529 dhrystones per second. With two benchmarks running, the average speed was 265dhrystones per second or half as fast. With four benchmarks running, the average speed was 135 dhrystones per second or one fourth as fast. The task switching overhead appeared to be negligible.

Is multitasking really that useful? I have found only two areas where multitasking is really useful to me: spooling to the printer and uploading or downloading files over a modem. I accomplish both of these tasks often. They are the only occasions when my computer is slow enough that I have to wait for it. A multitasking operating system solves these problems, but simpler solutions are available.

There are several background print spoolers that will spool files to your printer while you use another application in the foreground without a multitasking operating system. I use *DeskCart* for this. *HabaWriter* and *WordPerfect* do this automatically. There is even a spooler available which will spool those terribly slow GEM graphics files to your laser printer in the background. Other programs are available that will upload or download files in the background on an Atari ST running TOS. One such program that I am familiar with is *Shadow*. I had a friend in Hawaii who ran a BBS on his Atari ST. He used a BBS program that he had written himself running as a background task under *MT C Shell*, another multitasking operating system available for the ST. This allowed him to used his computer for other things while his BBS was online.

One advantage that UNIX users enjoy is easy access to other UNIX machines through UNIX networks such as USENET. A UNIX program called uucp (for UNIX to UNIX communications program) allows any UNIX machine, with proper access privileges, to enter a network via modem and send and receive electronic mail, transfer files and even execute commands or programs on other UNIX machines in the network. Unfortunately, uucp is not one of the utility programs provided with MINIX.

CONS:

MINIX doesn't know about GEM or windows or even graphics. It can't address the serial port or the

midi port. The documentation for the application programs accompanying MINIX, particularly the C compiler, is almost nonexistent. There is no commercial software available that is ready to run under MINIX, and you can't even download software through the serial port. The only way that to transfer a file is by using the special utility programs included with MINIX to read a file from or write it to a TOS formatted disk.

PROS:

MINIX comes with commented source code for everything but the C compiler. The best way in the world to learn about software is by examining good, well-commented source code. It is expandable. It is reliable. (As far as I can tell, MINIX, itself, has never crashed my system.) MINIX is inexpensive. The documentation on the operating system kernel is excellent. MINIX will run on a 520 ST with one single-sided drive.

Conclusions:

MINIX is an excellent value if you want to learn about operating system design in general or UNIX in particular. It is also excellent if you want to learn how to use the UNIX operating system. It has some possibility as a bare bones system for developing UNIX applications. Don't get MINIX if you don't program or desire to program in the C programming language. The documentation for most of the utilities consists of commented source code written in C.

While interest in MINIX was initially high on the bulletin boards, interest has waned. When UNIX is released as a standard operating system for the Atari TT line of personal computers, Atari compatible UNIX applications might become available. If some of those applications run under MINIX, its popularity might return. I haven't tried running MINIX on a TT, but it is possible that it will run out of the box. If not, the source code is there for any patches necessary to make it run.

Alternatives to MINIX on the Atari include *Revolver* and *MT C Shell. Revolver* is a task switcher. It allows several programs to be loaded in memory at the same time. The active task is then manually selected by the operator. Only one task is active at a time. *MT C Shell* is a sort of add on to the TOS operating system, similar to *DeskView* for MS-DOS. It provides multitasking of TOS applications via a UNIX like command interpreter and uses the standard TOS disk file format. A more recent version of this program allows a single GEM application to run as the foreground process.

MINIX is an operating system with possibilities. The modular code lends itself to hand coding the time critical routines in assembly language to speed things up. Imagine, if MINIX learned about the GEM tool kit. Output to the screen from every task running could be piped to a windowing program that would match all output with its source task and then direct it to the appropriate window. Then, the user could open, move, and size windows on the screen for each task and ....

But, if that is what you really want, go buy an Amiga. Then, when you find out that much of the Amiga software prevents multitasking by circumventing the operating system or if you can't handle the Guru Meditations, spend $10,000 or so on an OS/2 or XENIX system. Of course, then when all your work was done, you couldn't play *Dungeon Master*!

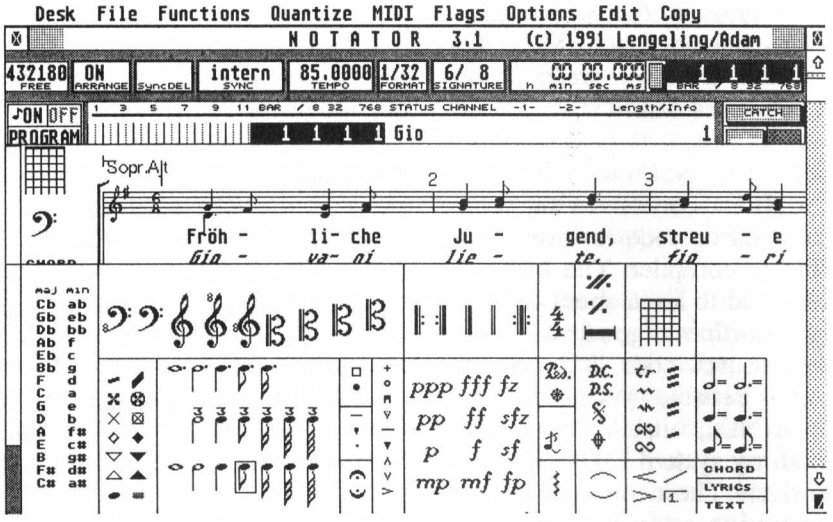
■■■■■■■

Notator 3.1

The Program That Helps You Make Music

by James Parker

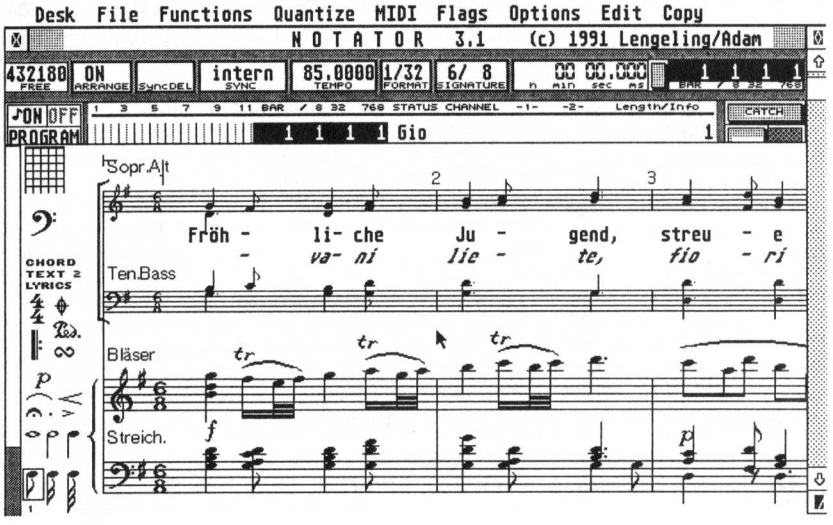
I have been using *Notator 3.1* for about 3 months and it's got to be one of the finest sequencing and scoring programs out for *any* platform. I arrange music for different sized ensembles, and needed something that would allow me to create quick scores and parts, without sacrificing quality in printout. I had been using *Dr. T's Copyist DTP* and it's not even in the same league as *Notator.* While a lot of scoring programs, like *Dr. T's* and *Music Printer Plus* for the IBM, seem to take a DTP style approach to scoring, *Notator* does it the right way, and approaches it from a musical aspect. Let me explain what I mean.



Notes Beamed on the Screen

With programs like *Dr. T's Copyist*, you are presented with a blank page on which to put your score. While the ability to control where every letter and symbol goes sounds great for a DTP program, it's not for a scoring program. Although this approach gives you great flexibility, it's more of a hinderance than a help. Having to manually space notes in bars, align beats with other staves, beam notes together, and add bar lines and rests takes more time than if you had to write it out by hand. The whole idea for a notation program is to make it *easier* and *faster* to create scores and parts, not harder and slower.

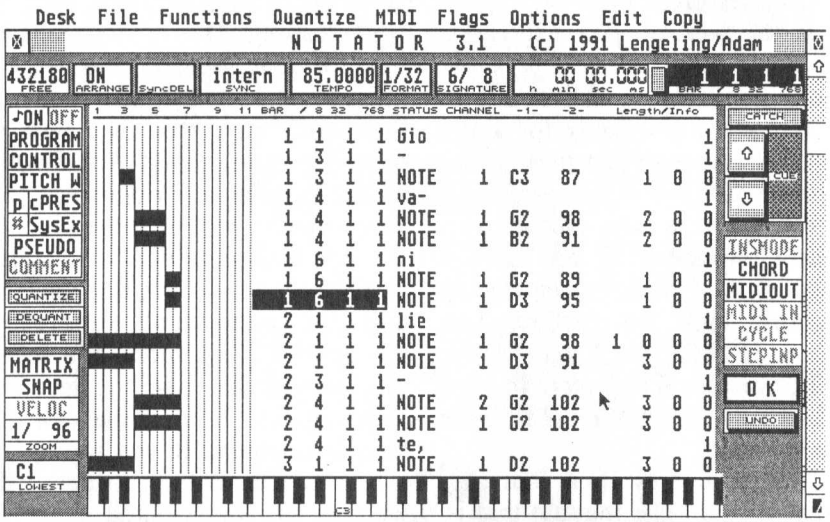
With *Notator,* there are a variety of ways to get the notes onto the score. You can use real time, step time, import a standard MIDI file, or the mouse.



Real time is where you play the music in via a MIDI instrument, in real time. As you play, the notes appear on the screen, fully beamed, correctly spaced with each beat aligned with all other staves, and with the correct number of beats in a bar. If you are a good with your MIDI instrument, then real time is the fastest way to go, but if you're not, don't worry! You can use step time, which is where you specify what the duration of the note is, then play your MIDI instrument at any tempo you wish. This is handy for entering very fast or difficult passages, and again, the notes appear instantaneously.

You can even get pre-made sequences (as long as they are in the standard MIDI file format) from bulletin boards or commercial sources and import them directly.

The last way, the mouse, is the mode I use most often. Simply drag the notes from a "Part Box" onto the stave, and drop them where you want them. Beaming, rests, alignment, and spacing is ALL AUTOMATIC. And, you can adjust all of it if you need to, no



problem. Using a combination of real time, step time, and the mouse enables me to get the job done much faster and more accurately than if done by hand.

Commercial Quality Printout

Using *Notator* helps speed the process up in other ways as well. You won't lose valuable rehearsal time due to unreadable parts or to correcting rhythms, notes, or manuscript errors, like too many beats in a bar. The printout rivals commercial quality on my HP Deskjet, and drivers are included for 9 and 24 pin printers, as well as the Atari laser, and HP compatible laser printers.

Notator is half sequencer, half notation. This enables you to play back anything you have scored at any time, and watch the music scroll across the screen! If you have a wrong rhythm or note, you'll be able to hear it and fix it before the first reading. It's simply impossible to have too few or too many beats in a bar. If you try to stick another note in a full bar, *Notator* will assume you want that note to sound with another note and simply "stack" it on top. This allows for piano parts, condensed scores or other instances where you want multiple notes sounding simultaneously on the same stave.

If you don't have enough notes in a bar to fill it, *Notator* inserts the proper rests. If you change the time signature after entering a part, all the bar lines automatically adjust, keeping the correct amount of beats in each bar. Incredible!

Powerful Sequencer

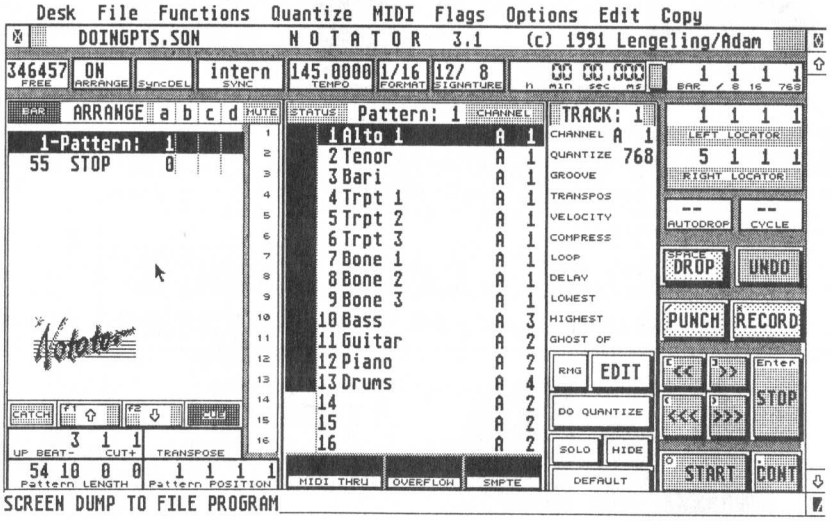
I haven't even talked about the sequencer side of the program, as I mainly use the scoring side of the software. It's as powerful as any sequencer out for the ST, allowing 1584 tracks, of which 64 can be simultaneous. Every track can contain up to 16 simultaneous MIDI channels and has unlimited polyphony capability. Optional MIDI expansion interfaces allow you to have up to 96 MIDI channels, if needed.

Besides being able to see the sequence as notes, you can also view the MIDI events through the Graphic Display, Event List, or the Matrix Editor. You can even use a combination of them, such as the notation editor, event list and the graphic display, simultaneously. All notes, durations, rhythms, and other MIDI events can be quickly and easily edited, and the results heard instantly over your MIDI instrument.

Notator also comes with a program called *Softlink* that allows up to nine programs to simultaneously reside in memory, so long as you have two megabytes of RAM or more. While designed to be used with other MIDI programs, I've found that it works with other programs as well, including *Pagestream* and *WordPerfect*. The only hitch is that *Softlink* first runs *Notator*, and from there you can access the different partitions.

While not overly difficult to use, *Notator is* a complex piece of software, and takes considerable time to master. Depending on what you use it for, be it scoring or sequencing, there may be functions that you never use, or even knew existed! Once you become familiar with the interface, you'll be surprised at how easy and fun it is to produce incredible results.

When I handed out the first piece I had arranged using *Notator*, I was asked numerous times what computer and program I used. I was more than happy to tell them "I use an Atari ST with *Notator* software." The next question was



always, "Can I get that for my IBM (or MAC)?". With a smug look on my face, I replied, "Nope. It's only made for the ST."

A Few Shortcomings

It all can't be good news, so here are the few shortcomings I can find. *Notator* is VERY finicky about what else is running with it. *UIS III, Multidesk,* and Atari's *Mouse Accelerator* will cause *Notator* to hang. Plus, if you have a Mega STE, you'll have to get rid of WCOLORS.CPX, COLOR.CPX, and set the CPU speed to 16 Mhz, no cache. To simplify matters, I run with a totally bare system. There may be some auto programs and accessories that work OK with *Notator,* but I haven't tried any others than those mentioned above.

One feature sorely lacking to me is the lack of jazz expressive markings, like falls, rips, and bends. This is very important to me as I write primarily for a Big Band and I have to pen these in after printing.

Even as it is now, *Notator* is a fantastic program. If you need a professional notation/sequencing program, look no further. List price is $699.00, but I found it for $499 at Leigh's Computers in New York (212) 879-6257. It's more than worth it.

Notator comes in a four-ring binder, with a huge manual that is, thankfully, well indexed. You also get two copies of the program disk, in case one is damaged. For copy protection, you must insert a "dongle" onto the cartridge slot. Without it, *Notator* will lock up while loading. This is an acceptable form of copy protection to me, but musicians who buy the new ST Book may have trouble. Latest reports say that the ST Book won't have a regular cartridge port, but an expansion port of some kind.

You also get a disk of tutorials that are easy to follow, and don't require the manual at all. Simply load the tutorial (it's a score) and follow the instructions, step by step. The tech support line, while not toll free, is excellent. If you would like a brochure describing in detail the features of *Notator* and other C-Lab products, write to:

C-Lab Software, P.O. Box 750, Nevada City, CA 95959-0263

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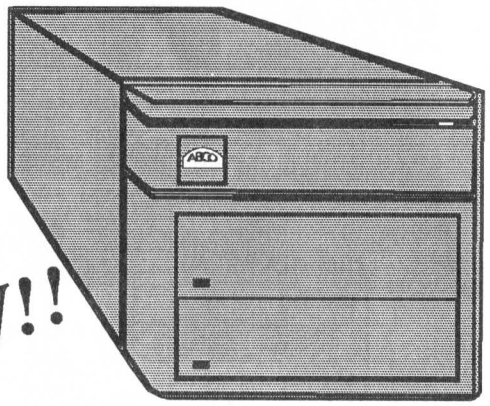

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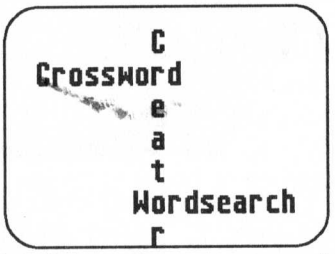
Crossword Creator

Word Games

WordSearch Puzzle

by Bob Ledbetter

What's a seven letter word that's used in both crossword and wordsearch puzzles? Creator. As in



Fair Dinkum has come up with the fastest, easiest to use, and most complete word game programs ever developed for Atari computers.

When you first get the program(s) (available separately, or together in the "Puzzle Pack") you run the ingenious registration program(s) and your name magically appears in the first screen of each program. (See the included illustrations). Along with your name is your serial number. When you return the registration card, you include the serial number to become eligible for future upgrades.

Both programs are very intuitive and straightforward and include excellent manuals. Such a deal! *WordSearch Creator* will create, by far, the most puzzling puzzle, and when using the "Intelligent Fill" feature the hiding of words is downright sneaky! Intelligent Fill uses fill characters based primarily on those in the words already entered into the puzzle. The manual says, "This method makes solving your word search puzzle considerably more challenging." Now if that's not an understatement, then trains don't run on tracks!

Crossword Creator II is also an easy to use, fun to watch, "wordnut" program. Although "complex fit" is not included in its placement of words, it does produce some very enjoyable puzzles. If, during this placing process, you see where some words could fit that the program hasn't seen, you have the option of inserting those words "manually." In that process you will make what the program calls "nonsense" words because it hasn't been told the new words are okay. However, when the new words have been added, all is well.

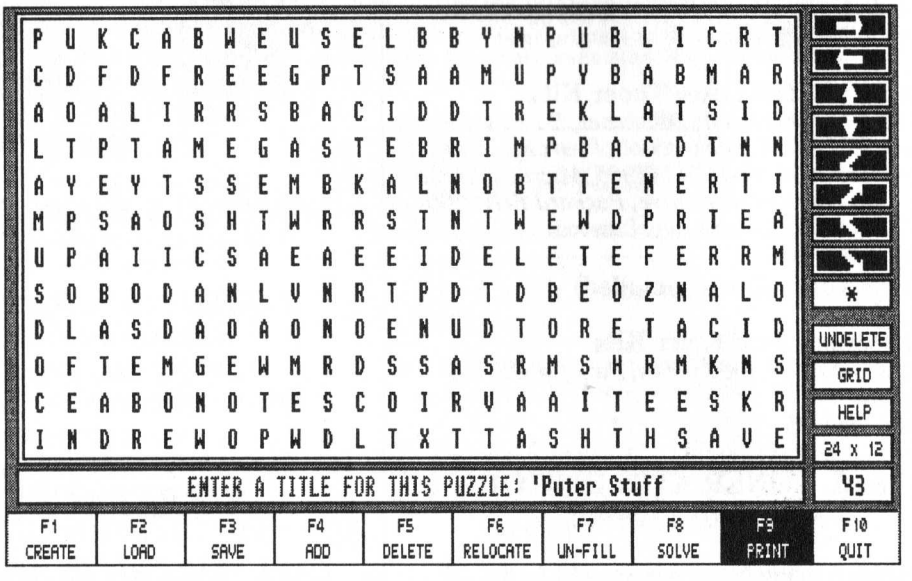
Both puzzle programs are "creators," and, if you want to, you can make a list of words and the creator will design a puzzle with as many words as possible from that list. After a puzzle has been created in this fashion, you are told how many words were used and what percentage that is of the total. You are then given the opportunity for it to re-create another puzzle with a better fit. This can be done until the cows come home or you get a 100% fit, meaning all words from your list have been used.

Both programs will save a picture of the puzzle in Degas format, and that is where I experienced a couple of glitches. I didn't get the result I was expecting. Instead of getting a picture of the puzzle, I got a picture of the entire screen which contained the puzzle. Just like I would have gotten had I used the *SNAPIT* screen grabber. The other occurred when I tried to print the solution of a WordSearch puzzle. I got the word list, but I was expecting to see the puzzle with the words circled as it was on the screen at the time. It was back to *SNAPIT* to get a copy of the solution.

So I called John Hutchinson, Owner/General Manager of Fair

See if you can find these words in the puzzle below.

ASCII	BACKUP	BITS	CALAMUS	COPY
CPU	DATA	DATABASE	DBMAN	DELETE
DOC	DOMAIN	DOS	DTP	FLASH
FLOPPY	FORMAT	FREEWARE	HARDDISK	HERTZ
INTERLINK	LDWPOWER	LOGO	MEGASTE	MONITOR
MOVE	NOTES	NYBBLES	PRINTER	PUBLIC
RAMBABY	RENAME	SAVE	STALKER	STE
STENO	SUPERBASE	TOS	TRACKS	TXT
VANTERM	WORDS	WRITE		



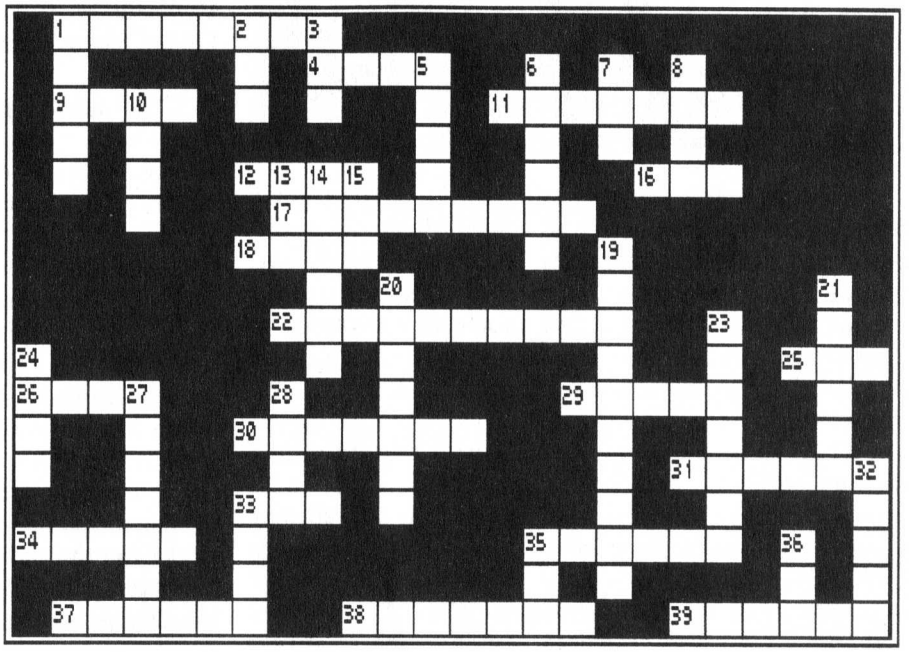
Dinkum. His answer: "In the copy I sent you, that's exactly what you'll get. I was fixing another bug and those sneaked in on me. They were related and they've been taken care of. I'll send you a fixed copy. Sorry for the inconvenience, mate."

As a side note, Frank asked me if I could send him the puzzles in *Publisher ST* format. Didn't think it would be a problem as I still have the program, although I haven't used it much since upgrading to *PageStream 2.1*. When I imported the word list for the puzzle, I tried it as an ASCII file import and got all kinds of strange looking creatures instead of text. I then tried importing the same file as a *First Word Plus* file and got the words, but not in a column format. I had to manually rearrange them into text columns. Publishing the *Word Search Creator* in *PageStream 2.1* is a much easier process.

When it comes to printing, both programs are designed primarily for 9-pin Epson™ compatible printers. When I started working on this review, I had a 9-pin Seikosha, and the puzzles printed just fine on that printer. Less than a week ago (April 18th to be exact), I upgraded to a StarJet SJ-48 (Star's answer to the Canon Bubble Jet) and when I asked the programs to print the puzzles, voila, no problems. Since the SJ-48 emulates the Epson LQ-850, I really wasn't expecting any problems and was not disappointed. By the by, the SJ-48 is a slick little number. Watch for a review.

So, if you enjoy creating or solving word games, *Crossword Creator II* and *WordSearch Creator* might be the perfect solution. I enjoy making a list and watching how the creator puts them in place. Fair Dinkum is working on *Crossword Creator Professional* and their goal is to create "New York Times"-style puzzles automatically.

desert



Created with Crossword Creator II

ACROSS

1. shrub
4. not cool
9. a desert brush
11. illusions
12. mountain lion
16. arid
17. a calamity
18. it's all over
22. a rattler
25. whisky
26. uninvited guests
29. lizard
30. opportunist
31. blossom
33. queen, or worker
34. -----pipe cactus
35. things to watch for
37. welcome relief
38. natives
39. saguaro, for one

DOWN

1. fertile spot
2. destiny, fate, much
3. a wise one
5. table top mountains
6. desert dwellers
7. a necessary item
8. bucks or bulls are male, does or cows are female
10. a certain type of fever
13. where the Mojave is located
14. insect
15. in addition
19. it's a lizard, not a toad
20. piglike mammal
21. night time howler
23. cactis
24. dates grow on these
27. organ pipe cactus
28. a carrier of things
32. they're all over

CWC Professional will also include a special crossword dictionary, and have printer drivers for Atari SLM, HP DJ, HP LJ, and Epson 9-pin and 24-pin printers built-in. "However," John Hutchinson says, "that's a fair piece down the pike." John told me that special versions of the programs may be made for TT resolutions as well, depending on demand. As they stand, *Crossword Creator II* and *WordSearch Creator* worked just fine on my 1040 STe/2 from my Megafile 20, with the Thompson 4120 Color Monitor. Product support is available on GEnie in the "ST and Education" category of the ST RoundTable. GEmail address is "FAIR-Dinkum." John Hutchinson lived in Australia for awhile and he says "Fair Dinkum" is down-under for "a good deal at a good price." Absotively true! G'Day, Mate!

[Fair Dinkum Technologies, P.O. Box 2, Los Alamos, NM 87544 (505) 662-7236.]

(Answers to these puzzles can be found on page 51, but don't peek!)

FIDONET

by Steven Leser

Education and learning can best be accomplished through the free exchange of ideas. Many of us discuss ideas with our classmates, professors, friends, and family. The disadvantage of most of these interactive exchanges is that many of the people we interact with are similar to us. They live in the same area, and thus like, dislike, or have been exposed to many of the same things.

The question is, how do we easily communicate, interact, discuss, and debate ideas and issues with those who don't share similar geography, and similar views? Communicating long distance by telephone is prohibitively expensive. Letter writing is cheap, but it only offers one on one interaction. What if your ideas and views could be read and responded to relatively quickly, and inexpensively, by hundreds of people nationwide, and worldwide? What if this medium also offered the attractive choice of breaking up the discussion into several hundred subject areas in which people interested in similar topics from AutoCadd to Zymurgy, and Space to Politics could brainstorm and debate to their hearts content? Does such a prospect seem attractive?

These very things are accomplished through the big computer networks. These include UseNet, InterNet, FNet, FidoNet, and several others. The biggie (and the one I am more familiar with) is FidoNet. All you need to access FidoNet is a computer and a modem (and some inexpensive communications software). FidoNet is carried on over 13,000 bulletin board systems worldwide. A user on any BBS (bulletin board system) that carries FidoNet can send messages to any user on any other FidoNet BBS. Exactly how this is accomplished, I will explain later in simple to understand terms. Right now you are probably thinking, "How much does this cost to use?" As of now, most BBS operators (More commonly referred to as SysOps, which is short for System Operator) pay a nominal fee of $3.00 to $5.00 per month to recieve as many subject areas as they wish. Since the fees are so low, they don't bother (in 99.999% of the cases) to pass on the costs to you the users. So, generally, *you aren't charged for using this wonderful global ideas exchange network!!!!!*

How does it work? Each BBS has what is called a node address. This distinguishes it from all other FidoNet BBS's. FidoNet's administrators maintain a huge nodelist (much like a phonebook) that is updated weekly.

The first part of the nodelist is known as the zone. This divides FidoNet up by continent. Zone 1 is the United States. Zone 2 is Europe. Zone 3 is Australia, etc.

The second part of the node address is the Net. The Net is more like the area code and exchange in telephone number terms. For instance, the Net number for Colorado Springs is 128.

Finally, we have each BBS's private number within the local Net. The full node address for my BBS is 1:128/78. Now that you understand the concept of a node, I can explain the routing of messages.

There are two methods of sending messages in FidoNet. Themost basic is Netmail. Sending Netmail is much like writing a letter. You tell the BBS who you are sending it to, and what their node address is. That night, the BBS you wrote the message on calls the BBS of the recipient, and transfers the message to it. The next time the recipient calls the BBS (more commonly referred to as "logging on" the BBS), he is informed that he has a message waiting, and is prompted to read it.

As you can imagine, Netmail is the least popular method of transmitting messages because it is limited to one on one "conversations" and it can involve a long distance phone call.

Echomail is the truly exciting part of FidoNet. Echomail is where you have the several hundred discussion areas where people get together to discuss subjects that are of interest to them. On my BBS, I carry over 30 of these areas including Politics, Space topics, International Cooking, Diabetes discussions, MENSA, Virus Information, and many others. Each SysOp decides which subject areas he wishes to carry. With several thousand BBS's worldwide participating, the volume of messages is tremendous! Even so, one gets to know the people participating after just a short while, and the discussions and debates are fantastic.

Echomail routing is accomplished through several regional hubs. Without going into too much detail, each SysOp informs his hub of which areas he wants to recieve. At night, the hubs exchange any messages that users on the various BBS's in their areas of the country, and world wrote. These messages are then passed on to all BBS's that carry the particular areas.

Here are a few messages from the Atari 8-bit echo...

From: Henry Schupp
To: Vinnie Rinaldi
Subject: BOBTERM/SDX

01 Mar 92 11:23:

I just read my last post to you and can't tell if it went out properly so just to be sure the right info is there for you the following needs done:

CONFIG.SYS =

USE BANKED
DEVICE SPARTA
DEVICE SIO
DEVICE INDUS
DEVICE CLOCK
DEVICE JIFFY
DEVICE RAMDISK 9,18 (or not...)

AUTOEXEC.BAT =

LOAD ›ATARIDOS.COM (the › redirects to disk not cart)
LOAD COMMAND.COM
TIME
DATE
X BOBTERM

Now as long as you have renamed your boot modules (BTM) as told in the BOBTERM docs it should work now.
Bye,
Henry P. Schupp
915-653-2378
---
* Origin: Animal House (CSP) San Angelo, TX 915-942-9350 (1:383/300)
SEEN-BY: 10/8 11/1 50 12/12 13/13 102/2 103/355
SEEN-BY: 104/1 105/103 107/3 128/23 45 78 87
SEEN-BY: 147/46 1000 151/1003 202/1 206/2703
SEEN-BY: 207/101 209/1 209 266/22 268/202 272/39
SEEN-BY: 283/657 290/627 300/5 343/300
SEEN-BY: 383/13 300 2424 3396 387/823 389/2 395/3
SEEN-BY: 396/1
PATH: 383/300 13 3396 147/46 13/13 209/209 128/87 45

From: Mike Moeller
To: Bobby Clark
Re: FAX?

01 Mar 92 09:46:54

» Anyone aware of a way to set up these new 2400/FAX modems to an 8 bit?
» The hardware is there/ any software?

» Well ... if these modems have RS232 ports, then hardware (i.e. P:R or 850)
» and software (the appropriate handler for the RS232) should be no problem.

One thing, Bobby. I tried using a brand new V.42 FAX/MODEM a while back with my P:R: connection. The RS232 port in the particular FAX/MODEM I used did not work with the Atari, because the port was specially wired for an IBM AT/XT. (As I later found out). If you DO get a FAX/MODEM be sure it has DIP switches to make it configurable with Bobterm. Bobterm looks for particular signals, and if the RS232 on the modem is made just for an IBM, they will need be changed, (or the port itself re-wired, if that is possible). Also, V.42 modems do not work well (at all?) with Atari and Bobterm at least. It confuses it.

Mike Moeller
--- QuickBBS ST v1.06+
* Origin: KAUG BBS -=*(615)691-0113*=- Knoxville, TN (1:3615/17.0)
SEEN-BY: 10/8 11/1 50 12/12 13/13 102/2 103/355 104/1
SEEN-BY: 105/103 107/3 128/23 45 78 87 147/46 1000
SEEN-BY: 151/100 1000 1003 202/1 206/2703 207/101
SEEN-BY: 209/1 209 266/22 268/202 272/39 283/657
SEEN-BY: 290/627 300/5 343/300 396/1
PATH: 3615/17 1 151/1003 13/13 209/209 128/87 45

At the end of each of the above Echomail messages, you can read the list of all the Nets and indivual BBSs that received the message.

As you can see, our Atari computers are well supported on FidoNet. Besides the 8-bit echo, there are also Atari-ST, and ATARI ST programmers echos. This is a resource that the Atari user cannot afford to be without!

[Editor's Note: If you want to know your nearest FidoNet BBS, drop me a line or E-mail with your area code and phone number--Rick Reaser]

Current Notes PD/Shareware Cartridge No. 1

112 Disks: #347 - #459 (July 1989 to June 1990)

$119.95

Adventure Games
362 A Dudley Dilemma
363 Tark
364 Susan, A Lustful Game (R)
364 Love's Rapture (R)
365 Pork
365 Des Ring
366 Adv Game Toolkit
366 Alice
367 Colossal Cave
367 Crusade
367 Elf's Adventure
367 A Fable
367 Ghost Town
367 Paranoia
367 Odieu's Quest
367 Squynchia Adventure
367 Underground Adv

Applications
370 Norad
380 Revolution Handbook
382 SubCal V1.14
402 Construction Est.
424 Micro RTX Demo
440 Star 2000
452 Andromeda (M)
452 MegaBlit V2.8 (M)
452 Public Painter (M)
455 Inventory Pro, V3.0

Desktop Publishing
351 Pub Partner Fonts
353 Print Master #3
354 Print Master #4
355 IMG Woodcuts
357 Pagestream Fonts
358 Calamus Fonts #1
395 TeX: Program
396 TeX: Printer Drivers
397 TeX: MetaFont
398 TeX: IniTeX, SliTeX
399 TeX: PicTeX, MuTeX
416 Clip Art Borders
431 KidPublisher Prof
432 Calamus Fonts #2
442 Clip Art-People
453 Clip Art-Trans.1
454 Clip Art-Trans.2
457 Pub ST Borderpack

Demo Programs
384 Geography Tutor
386 JILCAD 2D (M)
407 Sheet
411 SpiritWare Conc
420 .ACCESS!
445 Body Shop
445 Geography Tutor
450 Master Tracks Jr
456 PageStream V1.8
459 Atari Cash Register

Games
348 Companion
348 Trivia Quiz
356 Bolo
359 Pentimo (M)
360 Bermuda Race II
361 Rocket Patrol
361 Trifide
373 Strip Breakout (R)
383 Baseball Simulator
387 Empire Maps
388 Breach Scenarios
389 Star Trek
390 PileUp V2.0
391 Super Breakout
419 Blaster
419 Invaders
419 ST-Tetris
419 Draw Poker V2.5
419 Darts!
421 ST Tetris (M)
421 Dragon (M)
421 MacPan (M)
421 Sokoban (M)
421 Draw Poker V2.5 (M)
426 Mean 18 Courses
428 Eco
428 Orbit
429 Alien Blockade
429 Atom Smasher
429 Gran Prix
436 Stellar Starfighter
436 Flight Levels
436 Lunacy!
438 MiniGolf (M)
438 PBM Chess(M)
438 Gilgalad Adv (M)
438 GNCIPHER (M)
446 PileUp V2.1
447 Blobbrun
447 Virtue

Graphics
368 Seq: Dunk Shot
368 Seq: Pitch
369 Seq: V.Johnson
371 Berthold's Pics #1
392 Spectrum #6-People
393 Spectrum #7-Space
394 Spectrum #8-Cars
408 ANI ST
409 Seq: Visitor
409 Seq: Froggie
410 Spectrum Clip Art
417 Saturn Pics
418 Seq: Skull
418 Seq: Dalek
418 Seq: ZNETart

Language
349 Xformer Prgs #1
350 Xformer Prgs #2
378 Elan-1
400 GFA Tutorial

Telecommunications
347 Moterm Elite V1.41
381 VariTerm, V3.81
381 DCOPY V3.2
422 Uniterm, V2.0E
449 HagTerm Elite V3.3
449 MiniBBS

Utilities
352 Art Gallery
352 Degas Snap
352 Deluxe Slide ShowV2
352 MetaView
352 IMG Show
352 ST Banner
352 Image Ed Acc V0.65
352 Snap Shot Acc
374 Desk Manager V2.1
374 Lil Green Sel V1.4
374 Pin Head V1.4
374 DIRsleft
374 Multidesk V1.1
374 HotWire Demo
374 MIDI Max! V1.0
375 MegaBlit V2.8 (M)
375 Quick INF V1.3
375 MegaWatt Acc
375 Quick Find V1.5
375 Quick Index V1.5
375 MegaBoot V1.1
375 Quick Label V1.0
375 Quick ST V1.45
375 Quick Print V1.0
375 Quick View V1.4
376 NeoDesk Icons
376 NeoDesk Demo
377 Atari HD Util V3.01
379 DCOPY V3.2A
379 DCOPY Shell V1.2
379 Diskvfy
379 Floormatter
379 GEMlabel V3
379 Pack V2
385 DC Xtract Acc
385 DC Clock V3.3
385 DC Formatter V3.02
385 DC Deskey V1.0
385 DC Stuffer V0.9
385 Mystic Formatter
403 Cheetah V1.0
403 Redirect
403 Pack
403 Pin Head V1.2
403 Speed Reader!
403 Address Database
403 Disk Chart
403 File Finder V1.2
405 HP DeskJet Utilities
406 Assassin
406 Desk Manager V2.7
406 BooST V0.9
412 Arc-2-Lharc Switch
412 Lharc-ST V0.51B
412 ARC Shell V2.1b
412 ARCTTP
412 ARCXTTP
412 ARC521FXTTP
413 Check V1.1A
413 Cheetah V2.0
413 Diary Acc V1.7
413 Recover Trash V1.1
414 DC Showit V1.0
414 Lil Green Sel V1.6b
414 Super Boot V6.0
414 Quick Print V1.0
414 Star Struck V1.3
414 Switch 630
423 Picswitch V7.0
423 SPX Slide Show
423 B-GIF Converter
423 Conv to .IMG 0.90
423 Convert PM V1.5
423 Ideal IMG Size Acc
423 Convert PM to PI3
423 Print IMG Acc
423 Degas-Pic Acc
423 Degas-to-McPaint
423 IFF Converter V3.1
423 Convert Spec->Degas
423 Multiple IMG Setter
433 Diction Spell Check
433 Disk Label Printing
433 Form Fill V2.0
433 Fl St Screen Fonts
433 GrafX Display V0.9
433 Paperless Accountant
434 Convert to .IMG
434 Degas Elite Pixel Switcher Acc
434 Invert Degas
434 ElectroCop GIF Pics
434 ViewGIF V0.8
434 Alslide V2.1
435 Flu V1.30
435 Biorythm Acc
435 Text-Dump V2.0
435 UC's Disk Lib V1.5
435 UC's Clock Acc V3
435 UC's RAM Acc V1
435 UC's MIDI Strobe
439 2acypry/2accprg
439 NeoDesk Canvas
439 Clock Sync V1.6
439 DCOPY 3.2A
439 Fast LZH V2.0
439 NeoDesk INF Labels
439 RAMPLUS
439 ST-UNZIP V2.7
439 Templemon V1.19
439 Unlzh V1.61
439 UNTAR
439 UUD V3.1
439 UUE V3.1
441 TCOS V1.2
443 List66
443 Print HP DJ
443 Q-Text
443 ReorgHD V1.003
443 Sentry V1.01
443 Typecad Font Ed
443 DCOPY V3.4
443 DCOPY Shell V1.4
443 DC Show It V1.1
443 INF Change
443 Flexi-Fast
444 Address Label Pr V2
444 Convert to .IMG
444 GEMvelope!
444 HP Dump
444 Laserbrain fonts
444 Trim (blanks)
444 Monster V0.3
444 Pin Head V1.5
451 HP LJ Envelope Acc
451 HP Laserjet Cont
451 HP Jet Label V1.1
451 LaserJet V1 +5fonts
451 Pretty Print V1.0
458 Sticker Pictures

Word Processing
372 MagniWriter
401 ST Writer V3.4
415 Hardware Mods No. 1
425 DMC Laserbrain
427 Hardware Mods No.2
430 ST Writer Elite V3.8
448 Kepco Edit
448 Stevie V3.95

The programs listed above are available on CN cartridge #1. Programs are listed by category. Within category, programs are listed by CN disk numbers. The three-digit number indicates the CN library disk on which the program can be found. Note: an (M) indicates monochrome only.

CN cartrdges are $119.95 plus $4 shipping and handling. Individual disks are available for $4 each (10 for $35) plus $1 S&H for every 6 disks.

Order disks from
CN Library
122 N. Johnson Rd
Sterling, VA 22170
(703) 450-4761.

VISA and MC orders accepted.

Current Notes PD/Shareware Cartridge No. 3

95 Disks: #460 - #554 (July 1990 to April 1991)

$119.95

Adventure Games
494 Taipan II (C)
507 Text Adv Dev Sys
507 Ditch Day Drifter
508 Deep Space Drifter
513 Disenchanted

Desktop Publishing
461 Calamus Outline Art Demo
469 PageStream Font Editor
470 Clip Art #14-People
471 Clip Art #15-People
521 Clip Art #16-Old Cars
522 Clip Art #17-Cartoons
523 Clip Art #18-Misc Themes
524 Clip Art #19-High Res Pictures
538 Calamus Fonts (Advertise, Architect, Barnum, Broadway Engraved, Causal Loose, Celtic Roman, Flash Book, Fancy Chancery, Harloe, Kleranden Heavy, Mouse, SchoolBook, St. Francis, Suizo, Tiphany, Univ Bold, Univ Roman, Wild West, Windzor.)
552 Calamus Fonts (Lucifer, Tiempo, HORSE CAPS, LEE CAPS, MEDICI, ZALESKI CAPS) plus GEnie messages.

Database
545 Cardfile D.V1.43
545 Notes V0.9
548 First Base V2.0
554 Informer II D.
554 R–Base D.
554 TLC Address Book

Demos
460 DynaCadd D.
464 Personal Finance Manager Demo
465 Mail Pro Demo
526 eSTeem PILOT D.
541 God's Word^2 D.

Education
477 Class V2.05
477 EZ-Grade D.
485 Algebra 1: Linear Equations
486 Algebra 1: Verbal Problems
487 Basic Math Skills: Operations
488 Grades, Interims, Student Teams
495 TestMaster V2.01
516 Stargate V3.0 (M)
530 Cinema
530 Flash Card

Games
462 Bloodwych D.(C)
463 Blood Money Demo
463 Wipeout D.
465 Stocks and Bonds (M)
478 SpaceWars V1.0
479 Hero IID D.
479 Swiftar D.(C)
499 Starblade D.(C)
500 Yolanda D.(C)
500 Rick Dangerous D.(C)
501 Photon Storm D.(C)
501 Aquanaut D.(C)
502 Kid Gloves D.(C)
502 Back to the Future Demo (C)
512 Sorry (C)
512 ST Square (C)
514 Pileup V3.0 (C)
525 Gran Prix (C)
532 Maniac Miner (C)
532 Valgus
533 Collapse V1.1 (C)
533 Jeopardy (C)
533 Valgus^2 (C)
533 Triple Yahtzee (C)
534 HacMan II (C)
539 Toyota Rally D.(C)
539 Flimbo's Quest D.(C)
539 Defender II D.(C)
540 Simulcra D.(C)
540 Spellbound D.(C)
540 9 Lives D.(C)
543 Midi Maze II
550 STrabble
550 Nova

Graphics
482 Wallace #1 (C)
483 Wallace #2 (C)
484 Wallace #3 (C)
491 Wild Flowers (C)
497 Public Painter V0.1 (M)

Kid Games
476 KV-Me First! V2.0 (C)
504 KV-Match (C)
504 Letter Hunt (C)
504 Ench. Forest (C)
504 KV-Geog-1 (C)
505 SDI Adventure (C)
505 Mansion Adventure (C)
505 Mountain Adventure (C)
535 KidMixup Plus (C)
536 Rabbit (C)
536 Santa Clause (C)
536 Burger (C)
536 Circus (C)
536 Robin (C)
537 Perfect Match (C)
537 Makin' Aiken (C)
537 KV-Fonic (C)
542 Kid Story (C)
542 Wuzzlers (C)
542 Rebus Writer
543 Dreissig (M)
543 AKS (M)
547 Barnimals (C)
547 The Wolf and Seven Kids (C)

Music/MIDI
466 16-Voice Sequencer
467 MIDI Music Maker
496 Guitarist D.
498 Equinox Sound-Tracker V2.5
511 MIDI Mike V1.0
511 Music Studio Song Player V1.2
511 MS Player
527 Alchimie Jr. Music Sequencer
527 Name That Tune
528 Name That Tune Misc Songs
529 Name That Tune TV Songs
544 Pers Music Lib
545 Musicalc V2.02
546 TCB Tracker demo

Office
464 Payroll V3.0 Demo
464 Cost of Living Adjuster
464 Checkbook V1.14
493 B/STAT Ver. 2.36

Reference
480 Current Notes Catalog
481 CN Macintosh Collection
489 Area Code Locator
489 Postal
509 GEnie Files 9/90
515 Starting Block Columns

Telecommunications
472 Instant Graphics! V2.14
473 Instant Graphics! Utilities
474 MiniTerm Desk Accessory
474 MiniBBS Bulletin Board System
510 Nite Lite BBS
510 Vulcan Embassy BBS
517 Aladdin Program
520 Air Warrior, V2.0B
553 Aladdin's Magic Browser V1.1
553 GE files in Aladdin format

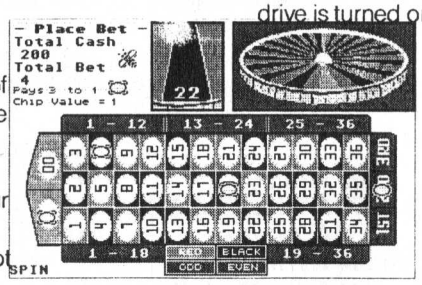
Utilities
475 HyperScreen
475 STDCAT V4.3
489 Shreader V1.1
489 Hot!Stat V1.1
490 Virus Killer V3.11
490 Hospital
490 Super Virus Killer
490 Flu
492 FastCopy III
492 HyperFormat
492 ARC Version 6.02
494 GFA Shell Plus
503 NeoDesk 3 D.
503 NeoDesk CLI D.
506 TLC-Play
506 TLC-Namr
506 TLC-Form
506 TLC-Attr
506 Mouse–db V3.0
506 Spirit Editor
506 A1-Time
506 Clock-5
506 Mouse Accel. V3
506 Ocultarx
506 Idle-22
506 UnLZH V1.72
506 Volume
506 ST Sentry V5.1
519 Printer Utilities
531 Quick ST 2.2 D.
531 Little Green Selector V1.88
531 Gram Slam Grammar Checker D.
548 Backup ST
548 K-Text V1.33
548 SText V1.1
548 PFXPAK
548 Library Master
548 TX2-View V1.35 D.
548 Pinhead V1.8
548 Bigcolor V1.05
548 SANDP V2.1
549 Arc to LHARC Switcher
549 Arc Shell V2.3
549 UNLZH V1.61
549 ARC V6.02
549 LHA V1.21
549 Arcgsh V3.5
549 Unerase
551 SuperBoot V7.0
551 Autosort
551 Digiedit
551 Picswitch
551 SnapIt
551 MassKill
551 FormDoIt

Note: A (C) indicates color monitor, (M) monochrome monitor, and "D." a demonstration version. These disks are all available on a single 44 megabyte Syquest removable cartridge ($119.95 plus $4 S&H). Disks can also be ordered individually for $4.00 each (10 for $35) plus $1 S&H for every 6 disks. Order from Current Notes Library, 122 N. Johnson Rd, Sterling, VA 22170. (703) 450-4761. VISA and MC orders accepted.

New Disks for June

#690D: STAR TREK - THE KLINGON WAR (C) Star Trek simulates a battle between the USS Enterprise and a Klingon Invasion force. Good graphics and digitized sound. Requires ST/STe with 1 meg of RAM.

#691D: ST GAMES. (C) *FLIPPED!* – a fun colored tiles game with 100 levels. *POKER DICE* – play poker using the roll of a die, excellent. *ROULETTE V 1.5* – like the casinos, learn how to win big bucks and how to place your bets. *COMPUTER YAHTZEE* – decent PD yahtzee game, four players, GFA compiled. NOTE: Flipped!, Poker Dice, and Computer Yahtzee may not work on STe's.



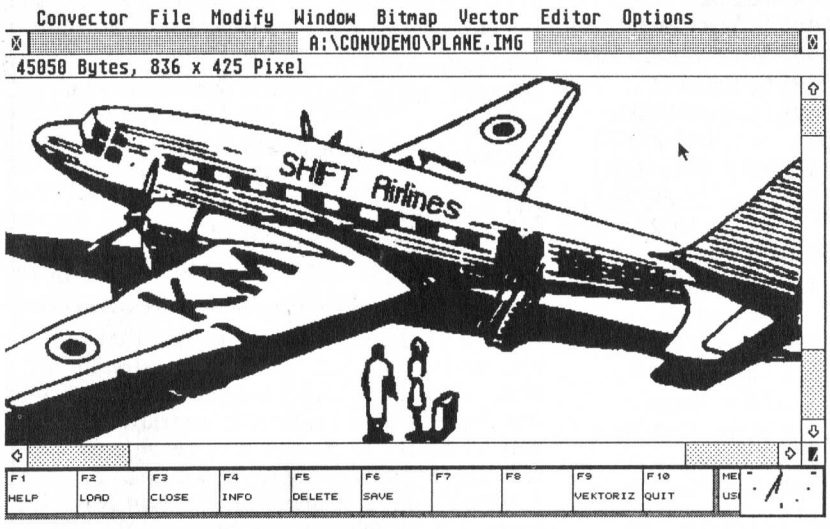
#692D: EQUALIZER (C) STe Moving Pixels demo. Listen to good digitized sound as you fly through a starfield. Includes working controls for volume/bass/treble/balance/etc.

#693D: DIGITIZED SOUNDS. Digitized sounds can be played on TLC–Player (included) as well as others. Sounds included: *CNNVOICE.SND* – CNN signature music and the voice of James Earl Jones; *DRAGNET.SND* – the beginning of the Dragnet theme; *LONGTARZ.SND* – tarzan yell; *I'VEFALL.SND* – lady who's fallen and can't get up; *TWILIGHT.SND* – beginning of the Twilite Zone theme; *ARNIE.SND* – Arnold from the Terminator(?); *EASTWOOD.SND* – Clint Eastwood's famous line.

#694D: QUARTET PLAYER 3/AMODEL DEMO. *QUARTET PLAYER 3* – As well as displaying song information, Quartet Player 3 provides a nice screen display. Works on any ST/STe in any resolution. Includes 4 songs and voice sets (*Are We Ourselves?*, *Outside Lookin' Inside, Oh Yeah!, Mission: Impossible Theme*). *AMODEL DEMO* – full–screen scrolling graphics with good digitized sound in the background (works best on STe's).

#695D: COMMERCIAL DEMOS. *CONVECTOR PROFESSIONAL* – the demo version of the autotracing program from Gribnif Software. All functions work, except for Save and Print. Good for converting bitmap graphics to vector graphics. *STOCK THE MARKET V2.01* – a full–featured stock charting, analysis, and portfolio management program for the Atari ST, Mega, and TT computers (Quidnunc Software).

#696D: UTILITIES. Over 20 utilities by Stuart Coates. *AUTO–CAPTURE* – utility for auto folder that will intercept all data that comes into your machine via the serial port and write it to a disk file before passing it transparently to your communications program. *HARD DISK BOOT WAIT* – eliminates the 20 seconds you must wait before turning on your computer after the hard drive is turned on. *DRIVE BOOT SELECT UTILITY* – allows you to select drive A or B to boot from. *BOOT SECTOR STORAGE SYSTEM* – allows you to store the boot sectors of all your software on a single disk. If you have stored the boot sectors and then a virus attacks your original disk, BSSS will allow you to re–write the correct boot sectors thus eliminating the virus. *CUSTOM DISK FORMATTER* – allows you to create your own wild and wacky diskformats. You can format up to 979 kbytes or down to 1536 bytes per disk, providing that your drive can cope with the extra tracks. *DISKCAT – THE DISK CATALOGUING SYSTEM* – a database system designed to handle a list of programs, utilizes your machines RAM (fast, but limited size). *THE REVENGE DOCUMENT DISPLAYER* – loads, displays, and prints out any ASCII document (includes many features). *DRIVE DIVERTOR* – allows you to run software that is designed for floppy only systems on a hard disk. *FILE KILLER* – small utility that can be placed in the auto folder of your boot disk that allows you to delete files forever. *THE FUNKY SCREEN FLIPPER* – turn your Desktop completely upside–down! *JCLABEL* – label printer for Med–res or Hi–res screens. *MARROW* – small utility that allows you to use your mouse instead of the cursor keys from within almost any program. *PC–TRACE* – very small program that allows you to find out where a machine code program is currently executing. *ST–REPLAY/MASTER SOUND CONVERTER* – converts samples between the Replay and Master Sound 2 formats. *SCAN–4–PIC* – allows you to examine program (and data) files for hidden pictures, and then save them out as a DEGAS compatible picture file. *ST–WORM* – "delete protects" your disk drives (both hard, floppy, and RAM) so that you can't accidently erase your data. Disk also includes: *DRIVE B: INSTALLER/DE–INSTALLER, DATA FILE TO BASIC CONVERSION PROGRAM, GO–ACC DESK ACCESSORY LOADER, SAMPLE COMPRESSOR,* and *STARTGEM bug fix for TOS 1.4.*



#697D: ST GAMES. (C) *EUCHRE* – pits you and computer partner against two computer opponents. *5 OF A KIND* – allows one or two players to compete in a yahtzee type game. *INVASION OF THE MUTANT CATERPILLARS* – demonstrates the new STOS 3D programming language. *BANG!* – figure out where the exploding mines are hidden on a grid (also runs in mono). More.

#698D: CALAMUS FONTS No. 7. Includes *Albatross Medium, Alexandria Medium, Andromeda Medium, ANS, Arabian Normal, Ashley, Becker Medium, Black Forest, Caligula, Caraway Bold, Deja_Vu, Dobkin,* and more.

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Current Notes ST Library

CN public domain disks are $4.00 each (10 for $35) plus $1 S&H for every 6 disks. Order from CN Library, 122 N. Johnson Rd, Sterling VA 22170. (703) 450– 4761.

February 1992

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642d: **System Disk Archives.** Complete archives for disks 640 and 641.

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644d: **Write-On Demo.** PD scrolling demo of the Write On! Req 1 MB (M).

645d: **Copilot.** Runtime version of eSTeem PILOT, an authoring language for creating tutorials, drills, tests, interactive dialog, games, and simulations.

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649d: **Finance.** Checkbook, Stock→Smart V2.1, MEGA–Check.

March 1992

650d: **GFA Expert.** Alternative GFA–BASIC 3 Manual, 2nd Ed. by Han Kempen, The Netherlands. 120+ pages.

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657: **Name Brand Clip Art.** 50 product logos. (IMG)

658d: **Language Helper.** MultLang (translation between German/English words.) SpellOne (spell–checker) Abbreviator ST V11 Demo

659d: **Utilities.** 2Columns, BootTyme, DC Reserve, Edi–Util, FileTool, Fishes, FujiWatch, GoGoST42, K__Text V1.6.4, Lock, NBM, v1.2, RAM__Test, ShowMem4, SilkMouse2, StarSaver V0.50, WhatIs57

April 1992

660d: **Clip Art.** Wild West 68 IMG

661d: **Clip Art.** Military 91 IMG.

662d: **Clip Art.** Police 44 IMG.

663d: **Clip Art.** Teddy Bear 1, 30 IMG.

664d: **Clip Art.** Teddy Bear 2, 30 IMG.

665d: **Clip Art.** Teddy Bear 3, 30 IMG.

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679d: **Sozobon C.** V1.33i, an ideal way to get acquainted with this popular language. Includes docs.

May 1992

The MiNT Collection: 680–684

680d: **MiNT Binaries.** The multitasking kernal used in Atari's upcoming MultiTOS. Includes docs and basic shell. Req at least 1 MB. Best results with a hard drive.

681d: **MiNT Sources.** The C source code for MiNT. Complete with documentation. Modify MiNT to suit your own needs.

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686d: **Cyber #1.** Cyber animation sequences: the golfing tragedy and the flight of the bumblebee. Viewer included.

687d: **C-Lisp.** The English release of Lisp for the Atari ST. This is the language used by several people in artificial intelligence. Note: documentation is limited.

688d: **STE Demos.** BALLS–raytraced balls moving over a semi–reflective picture of a fractal. DYNAMITE good sound demo with 8 Polyphonic channels 25Khz Digi–Synth Routs in stereo. 7 Soundtracks, 20 minutes of playing time.

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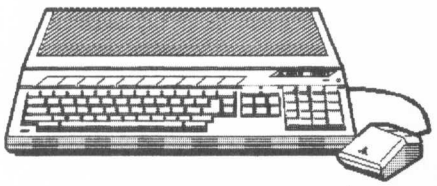

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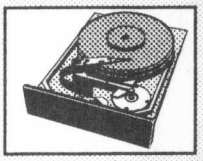

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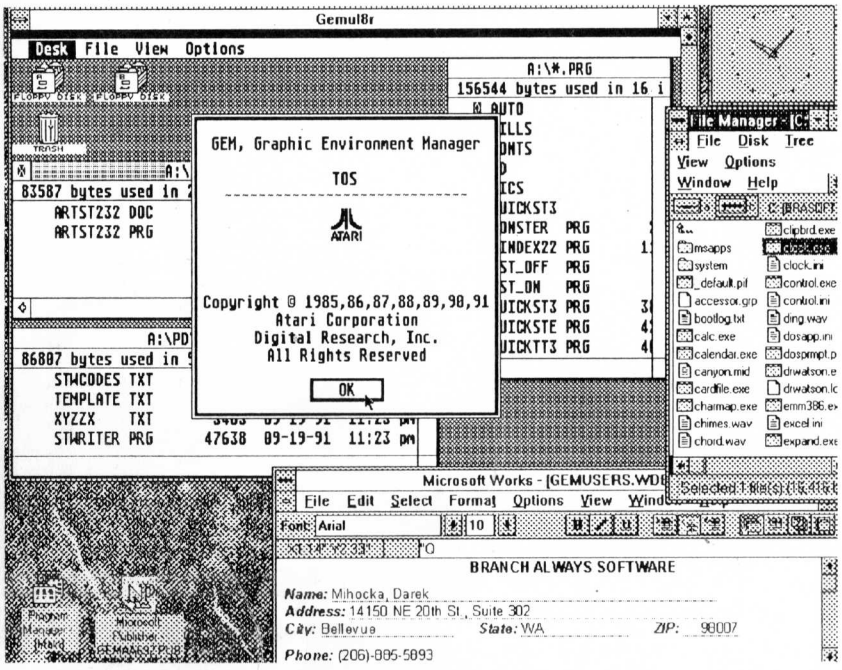

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